VOL. XXIX. CLEVELAND, O., MARCH 17, 1904. No. 11.

## SHIP YARDS AND SHIPPING OF SAN FRANCISCO

San Francisco, March 16. — The largest, most important and best-equipped ship building yard on the Pacific coast is the Union Iron Works, of which Henry T. Scott is chairman of the board; W. G. Dodd, president, and G. W. Dickie, manager. It was the late Irving M. Scott who raised the Union Iron Works to its present position of commanding importance among the ship yards of the Pacific coast. The Union Iron Works have been in existence many years and had acquired a high reputation for excellent and trustworthy work on mining machinery long before they began to build ships. The first vessel built by the works was the steamer Arago, in 1887. Since that year the concern has constructed war vessels of every type and class, torpedo boats, torpedo boat destroyers, gunboats, coast defense ships, protected cruisers, armored cruisers and battleships. A large fleet of merchant vessels of all classes has also been constructed.

The Union Iron Works have been very fortunate in building vessels that have attracted a large amount of public notice and have been in the forefront of notable events. The cruiser Chitose of the Japanese navy was built at the Union Iron Works and took a prominent part in the recent attack on Port Arthur. The cruisers Charleston, Olympia and San Francisco and the battleship Oregon are products of the Union Iron Works. The cruiser San Francisco was one of the vessels that took part in the United States navy review in New York harbor in 1893, at which all the leading naval nations of the world were represented by picked vessels. The British admiral said that she was the finest vessel of her class at the review. The San Francisco sailed from her namesake city and reported in New York with an absolutely clean sheet. Before the review her commander was asked if the vessel required anything and sent back the answer "nothing wanted."

When the Spanish-American war broke out the battleship Oregon was on the Pacific coast. She made the memorable run down the coast and round the Horn, and when she reached Jupiter Inlet on the coast of Florida, her commander telegraphed to the secretary of the navy that she had arrived and that his vessel was ready for orders. The gunboat Marietta, also built at the Union Iron Works, accompanied the battleship Oregon for nearly the whole journey, keeping up with her until the battleship made her final spurt on the Atlantic coast. The Marietta reported shortly afterwards to the commander of the Atlantic fleet in perfect order and ready for service.

On Manila bay the cruiser Olympia was in the front of the battle as the flagship of Commodore Dewey. Whenever Admiral Dewey hears the performances of the battleship Oregon praised, he exclaims: "Well, she isn't any better than the Olympia." After Dewey had destroyed the Spanish fleet in Manila bay, the German admiral manifested an inclination to annoy the Americans, who begged the government to send him a battleship to strengthen his squadron. No battleship being available, the coast defense vessel Monterey was prepared hastily for sea, and, accompanied by a collier with the necessary coal, sailed for Manila. She arrived in first-class condition and vastly relieved the anxiety of the officers of the United States fleet.

One of the most cherished possessions in the office of the Union Iron Works is a letter from John D. Long, then secretary of the navy, commending the splendid performance of the battleship Oregon and congratulating her constructors and builders on the excellence of their work.

The Union Iron Works have under construction for the navy department the armored cruisers California and South Dakota, both of 13,500 tons. These are the largest vessels yet built by the navy department, being 505 ft. long. The protected cruiser Milwaukee of 9,800 tons, is also well under way. The battleship Ohio is at the outfitting wharf and will soon be ready for her trial trip.

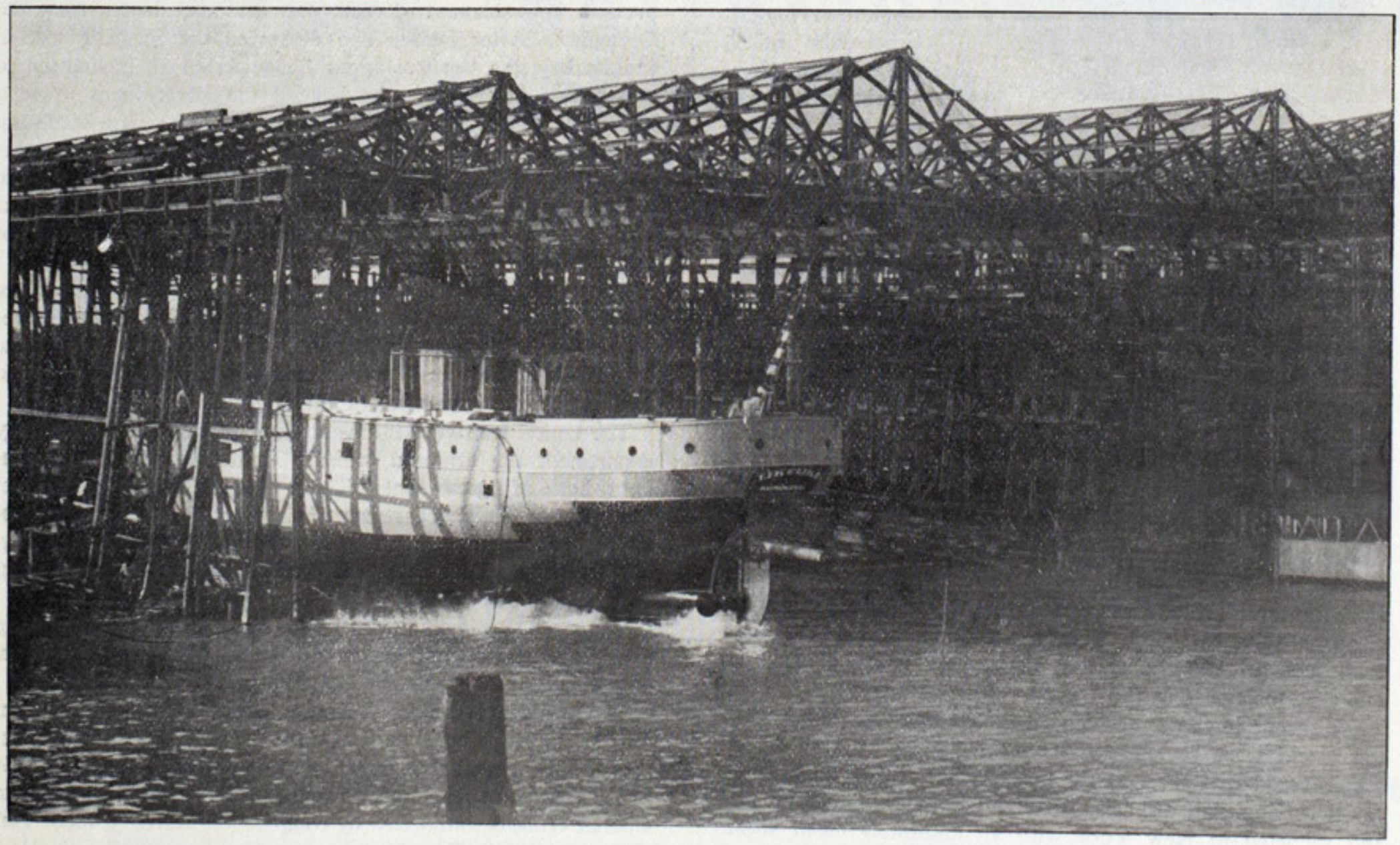
The steamer Likelike, constructed for the Wilder Steamship Co. of the Hawaiian Islands, will have her trial trip in a few days.

The protected cruiser Tacoma, built by the Union Iron Works, received her first trial on Oct. 28 of last year and exceeded all contract requirements. Her contract called for 16½ knots, but she made a fraction more than 17. She is one of the smaller cruisers authorized by congress on March 3, 1899. Her keel was laid in September, 1900, and she was launched on

June 2, 1903. Her length over all is 292 ft., her breadth 44 ft. 1½ in., her mean draught 15 ft., her displacement 3,200 tons and her indicated horse power 4,700. Her coal bunkers hold 700 tons, and her engines are of the four-crank triple expansion type. She is the first of the larger vessels built in Pacific waters to have a copper sheathing, which, it is expected, will do away with the necessity of docking frequently. The cruiser's hull is of steel, covered to the water-line with teak, which is sheathed with copper. This construction is somewhat of an experiment, some naval constructors contending that electrical action will be set up by the steel and copper and will cause the decomposition of the hull. In the case of the gunboat Marietta, however, this sheathing proved successful.

GENERAL VIEW OF W. A. BOOLE & SONS' SHIP YARD, OAKLAND CREEK, SAN FRANCISCO.

Though the shipping interest generally has been somewhat slack on the Pacific coast for the past year, there is considerable activity among the Alaskan salmon fishing fleet. The Alaska Packers' Association is fitting out more than forty



LAUNCH OF THE STEAMER LIKE-LIKE AT THE YARD OF THE UNION IRON WORKS, SAN FRANCISCO.

vessels, which are keeping the dry docks round San Francisco busy. The Northern Alaska Salmon Co. has bought several new vessels, and has built two gasoline schooners, which are found to be very useful. It is believed that they will take the place of sailing and steam vessels in that trade. These vessels draw only 5 or 6 ft. of water, so that they can go into shallow inlets and bays. A twin-screw gasoline vessel named Expansion has just been launched from W. A. Boole & Son's ship yard on Oakland Creek. A year ago they built a gasoline vessel named the Rita Newman, which has proved very successful.

The work of overhauling the United States army transports has kept the ship yards of San Francisco and the neighborhood busy, the government wishing to have the vessels ready in case of need in Central American and Asiatic waters. Army troop ships are being converted into horse transports in the yards of W. A. Boole & Son. The army transports Sherman, Sheridan, Thomas, Mead, Warren and others, have been overhauled.

The slackness in the shipping business has necessarily affected the firms which build and repair vessels. The subsidy granted by the French government to French vessels has induced their owners to accept cargoes at half rates, and has made matters hard for owners of British and other vessels. The United States steamers Sternberg and McArthur and the fish commission's steamer Albatross were at Boole's yard in February. Boole's yard for a year or more past has had a vessel per day under repair on an average.

UNITED STATES CRUISER NEW YORK ENTERING THE DOCK OF SAN FRANCISCO DRY DOCK CO., HUNTER'S POINT, CAL.

The Fulton Iron Works, situated at Harbor View, San Francisco, makes a specialty of building steam schooners for carrying lumber along the Pacific coast. They are constructed very strongly and solidly, so as to withstand the rough treatment to which they are subjected on the bars of the rivers that enter the ocean. The bar at Eureka, Humboldt county,

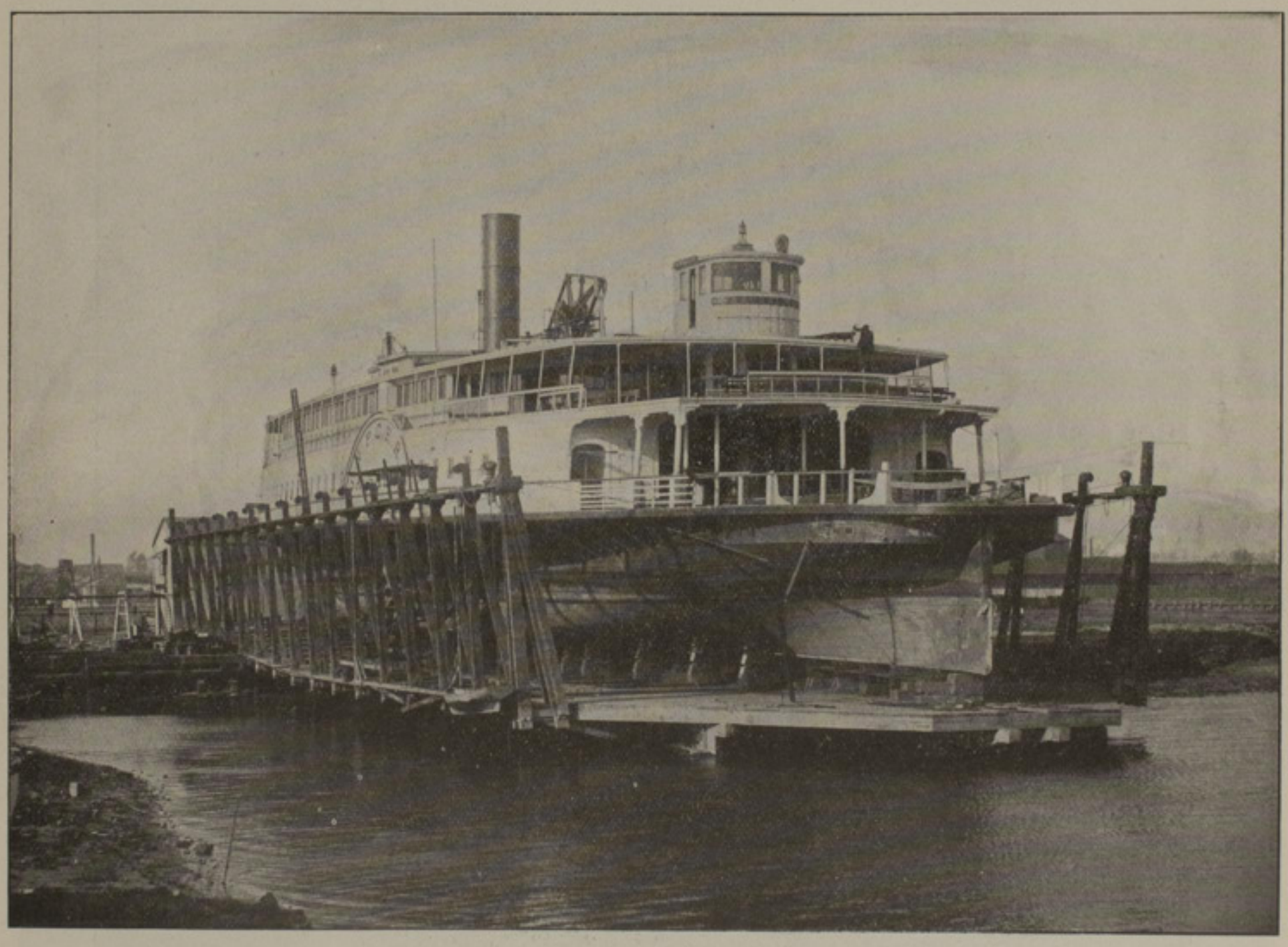
Cal., is so rough that no control can be kept over the vessel, and at some seasons of the year the bar at the entrance to San Francisco harbor is as bad. The vessels are built so that they will not go to pieces when pounded on a high bottom, and with high bows so that they may not bury their noses in the sea. They have ample deck space and large hatches, also a peculiar vertical hoist to handle the lumber effectively. This hoist really consists of two double-cylinder hoists, one of which sustains the weight while the other gives the direction to the boom, so as to swing the load over the side of the vessel or from the wharf into the hatch, as may be required. These vessels were formerly engined very simply with compound engines and Scotch marine boilers, but in the last ten or fifteen years the requirements of the steam schooner owners and of the United States inspectors have become more exacting. The machinery of the steam schooner of the present day is very different from what it was formerly, the engine approaching the type used in the navy, and being capable of driving the vessel along at a speed of 9 to 10 knots. The steam schooner Shasta, built by the Fulton Iron Works, made her trial trip on San Francisco bay on Saturday, Feb. 27. She is a good example of the present day steam lumber schooner.

The Fulton Iron Works constructed two tug boats for the Santa Fe, which carries its freight trains across the Bay of San Francisco on barges towed by powerful steam tugs. The barges have four tracks and accommodate twenty-four cars. The steamer F. A. Kilburn was built for the Watsonville Transportation Co. She has quadruple cylinders with triple-expansion, and is a fast boat of a somewhat different type from the steam schooner, being a combined freight and passenger carrier.

Several of the barge ferry boats used on the Bay of San Francisco were built at the Fulton Iron Works, among them being the steamer Sausalito, which was completed in six months; the Eucinal and the passenger and freight boat Ukiah.

Various causes contribute to render the building of steel vessels on the Pacific coast an arduous enterprise. Freight from the steel-producing regions of the United States is high: the wages of workmen on the Pacific coast are high, and the competition is fierce. No steel hulls have been built by the Fulton Iron Works for a year or two. The labor unions, which have attained extraordinary strength in California, increase the difficulties of ship builders and the customers take advantage of every technicality in the contracts for construction.

Few sailing vessels are built nowadays on the Pacific coast and the Panama canal will render them still more out of date. The sailing vessel might have to wait many days before she could enter the canal, and the towboat charges and tolls would render the passage costly.



FERRYBOAT SAUSALITO ON THE MARINE RAILWAY, SAN FRANCISCO.

Several steam schooners are being built by the Fulton Iron Works. The steamer Norwood is under construction for Sudden and Christenson; the Northland and an unnamed vessel for E. J. Dodge & Co. The Fulton Iron Works also makes a specialty of anchor winches, hoists and capstans. Some of these are remarkably compact and serviceable and are wholly above decks.

The Pacific Mail Steamship Co. is carrying on its regular service between San Francisco, Japan, the Philippine Islands and China by the twin-screw steamers Korea and Siberia and the steamer China. The Korea and Siberia are 12,000 tons each and were built by the Newport News Ship Building Dry Dock Co. They are the first vessels of their size com-

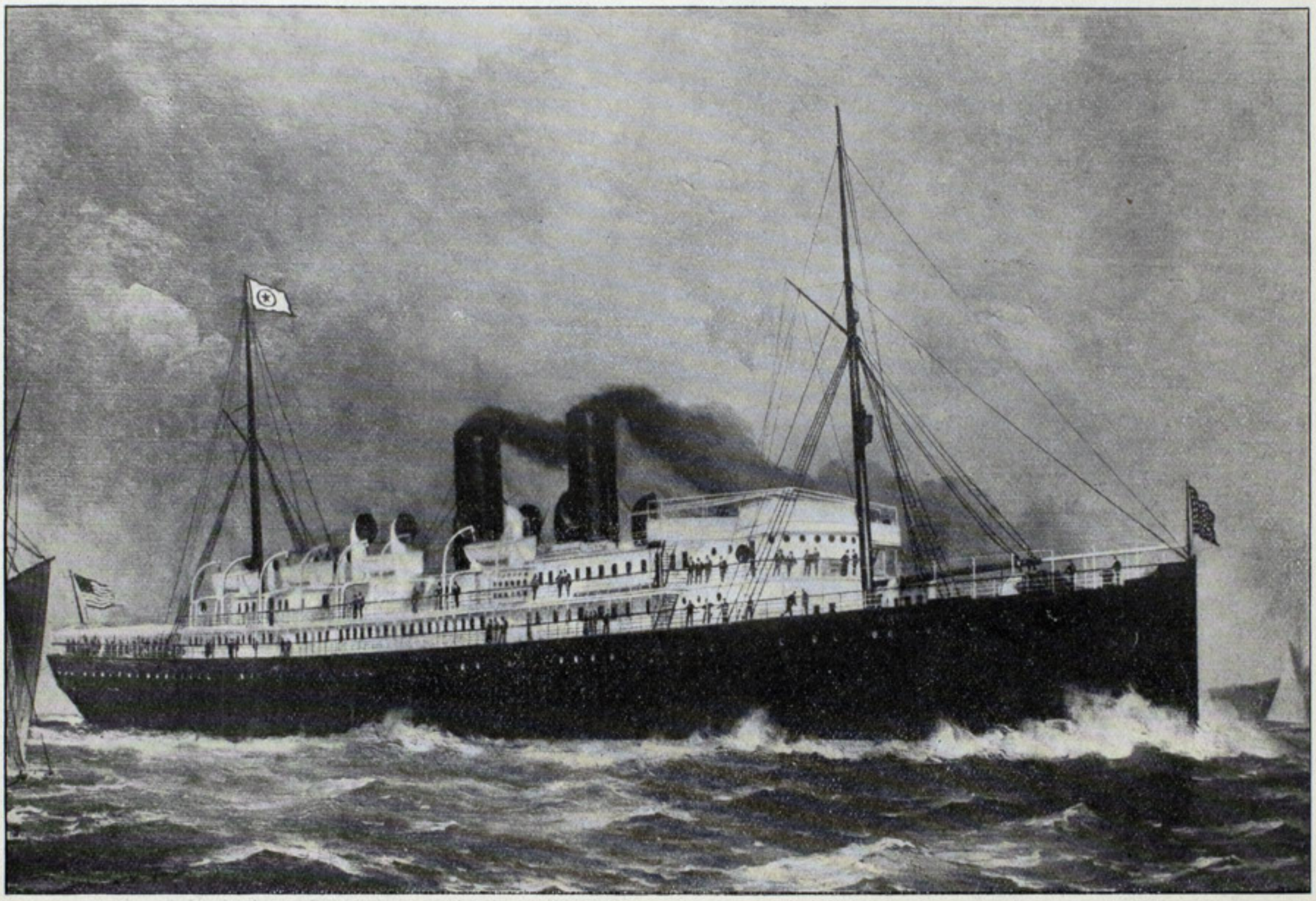
pleted in the United States, being 572 ft. 4 in. over all. The China was built by the Fairfield Co., Ltd., of Glasgow. She is 440 ft. long between perpendiculars and her tonnage is 5,100. The great vessel Mongolia, of 13,000 tons, is on the way to the Pacific coast, and the Manchuria, her sister ship, will follow soon. The City of Peking, 5,000 tons, is an extra steamer for emergencies.

The Pacific Mail Steamship Co. maintains a weekly service to the ports of Mexico, Central America and Panama. The fleet comprises the following vessels: City of Panama, Acapulco, Peru, Colon, San Jose, San Juan, City of Para, Newport, Barracouta, City of Sydney and the steamer Costa Rica as an extra vessel. One of these vessels sails every Saturday from San Francisco. The company's freight steamers are the large vessels Algoa and Aztec. Frank Stone is building a tug, about 120 ft. in length, at his yard on North Beach, for the Pacific Mail Steamship Co. The steamers Zealandia and Australia are laid up at Benicia and can be used as relief ships.

The Occidental & Oriental Steamship Co. (the "O. & O.") maintains a service between San Francisco, Honolulu, Yokohama and other Japanese ports, Shanghai and Hong-Kong by its steamers Doric, Coptic and Gaelic, one of which sails every twenty-five or twenty-six days. The Doric is 4,700 tons, the Coptic 4,500 and the Gaelic 4,300.

Communication between the United States and the islands of the Southern Seas is maintained by the Oceanic Steamship Co., or Spreckels Line. The fleet is made up of the steamship Alameda, Mariposa, and the new twin-screw steamships Sierra, Sonoma and Ventura. The steamships Alameda and Mariposa were formerly on the run between San Francisco and Sydney, N. S. W., but have been withdrawn from the long route. The Alameda has been rebuilt and re-engined by the Risdon Iron Works of San Francisco and makes a service to Honolulu every ten days. The Mariposa has also been rebuilt by the Risdon Iron Works and runs to Tahiti. The Sierra, Sonoma and Ventura are sister ships, built at Cramps, each 425 ft. long, 6,200 tons, and having a horse power of 8,000. They are capable of a speed of 17 knots. They sail from San Francisco every twenty-one days to Honolulu, H. I., Samoa, Auckland, N. Z., and Sydney, N. S. W.

The Pacific Coast Steamship Co. conveys passengers and freight from San Francisco northwards to Puget Sound, southeastern Alaska and Nome, and southwards to Coronado in California and Mazatlan in Mexico. The fleet consists of the steamships Umatilla, 3,069 tons; Queen, 2,727 tons; City of Puebla, 2,623 tons; Montara, 2,562 tons; Santa Rosa, 2,416 tons; Senator, 2,409 tons; State of California, 2,266 tons; Spokane, 2,036 tons; Cottage City, 1,885 tons; Valencia, 1,598 tons;



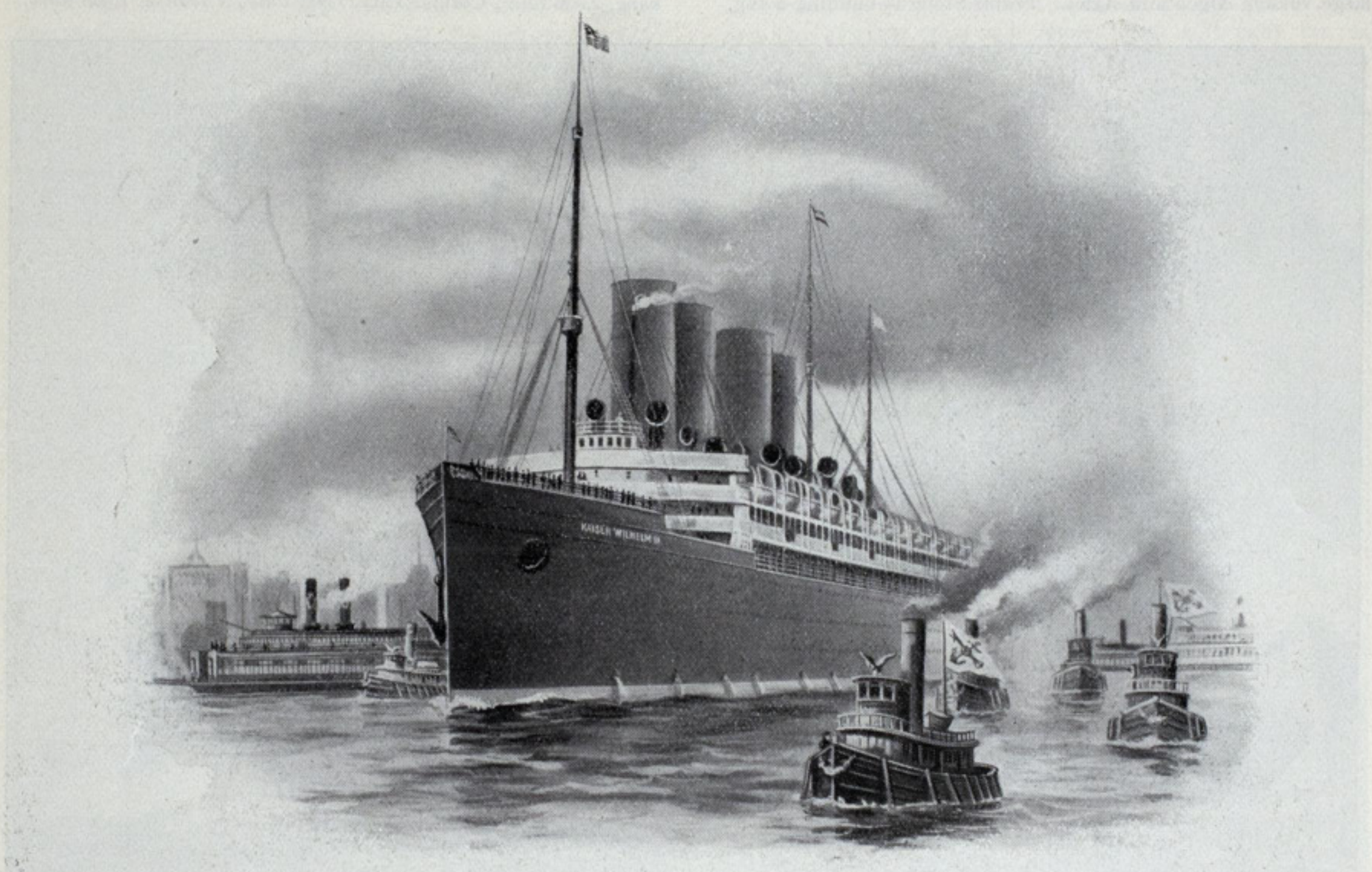
SIBERIA OF THE PACIFIC MAIL STEAMSHIP COMPANY'S FLEET

Curacao, 1,503 tons; Corona, 1,492 tons; City of Seattle, 1,411 tons; Pomona, 1,264 tons; Al-Ki, 1,259 tons; Ramona, 1,061 tons; City of Topeka, 1,057 tons; Sehome, 692 tons; State of Washington, 605 tons; Coos Bay, 544 tons; Bonita, 521 tons; Santa Cruz, 511 tons; Mainlander, 505 tons; and Gipsy, 293 tons.

The vessels of the Pacific Coast Steamship Co. on the British Columbia and Puget Sound route call at Seattle, Tacoma, Victoria and Vancouver, B. C.; Port Townsend, Everett, Bellingham, South Bellingham and Anacortes. At Seattle they connect with the Great Northern Railway and the Northern Pacific Railway; at Tacoma with the Northern Pacific Railway and at Vancouver, B. C., with the Canadian Pacific Railway. This service is maintained by the steamships Queen, Umatilla and City of Puebla. The steamer Mainlander is on the Bellingham Bay route. The steamers for Nome leave Tacoma and Seattle, the Senator making the first trip of the season on May 31 and the steamer Valencia sailing on June 9. The Senator will start from Seattle, Oct. 1, on its last trip.

## NEW YORK STEAMSHIP LINES.

New York, March 16.—Among the cities of a country there is ever one that stands out pre-eminently, by reason of the magnitude of its commerce, the superiority of its school system, or the natural beauty of its surroundings, for instance. Comparisons are generally rather ungracious; but it may be claimed, and this without much fear of successful contradiction, that New York is the largest, the principal, and the most prominent seaport on the American continent. New York was neither built in a day nor did it appear suddenly clad in all the panoply of modern ocean transportation facilities. Naturally, which means gradually, it evolved from the hamlet New Amsterdam into the Liverpool of the western hemisphere. And still



KAISER WILHELM II OF THE NORTH GERMAN LLOYD CO.'S FLEET.

the numerous steamship companies of this port are ever on the "qui vive" to branch out in other directions; to increase the size or the speed of their boats; to decrease the discomforts and dangers of ocean traveling.

The White Star Line is one of the principal component parts of the International Mercantile Marine Co. the Morgan combine. The designers of the boats flying a flag with a lone white star from the main trucks did not aim at producing what is now understood by "ocean greyhounds." But though in this company there is no striving to become the exponents of speedy ocean traveling, the enormous size of all their boats means comfort to every passenger. In truth—while as regards speed these boats fail to break records in these days, the White Star Line has an enviable record. It is now more than thirty years ago that Mr. Henry Ismay conceived the idea to improve the Atlantic passenger service. The first boat—the Oceanic—then regarded as a veritable leviathan, might serve as a tender to the modern steamer now bearing her name. The Belfast firm of Harland & Wolff that built the first 3,000 ton boats for the White Star Line has constructed every one of their vessels to date. And if praise is due to this steamship company for what in the expressive phraseology of the street is called "keeping up with the procession" the same applies to the Belfast ship building firm which was ever prepared to fill an order for larger, and yet larger boats. The present steamship Oceanic was launched in 1899; since then still larger boats have been added to the line, and it appeared as if the owners intended to continue this process of lengthening their steamers indefinitely had not the limits of pier accommodation and depth of the channel in New York's harbor interposed their veto. At Bootle—near Liverpool—the White Star Line maintains its own works, and it is there that minor repairs to their boats are attended to. To give an idea of the magnitude of operating an up to date steamship line two items of food as yearly consumed on board these boats are here given. First—food for the boilers—600,000 tons of coal are yearly needed to propel the two dozen odd boats of this company; Second—food for the passengers and crew—207,000 lbs. of butter is yearly used on board. In 1870 the White Star Line owned vessels whose combined tonnage only amounted to about 7,000, or a little over. In 1891 the tonnage owned by the firm had been increased to 84,900, while at present they certainly have not less than 300,000 tons of floating palaces. Their Oceanic launched in 1870 was a giant in those days with a length of 430 ft. The Oceanic of 1899 is a little over 700 ft. long, and the Celtic arriving from Belfast in 1901 measures fully 20,000 tons.

The Red Star Line added not long ago the Finland and the Kroonland, boats of about 12,000 tons carrying capacity. The Atlantic Transport Line expects soon to add the Minnelora and the Minnewaska to their fleet. These two steamers are—as is the case with all of the Morgan combine craft,—not intended for speed smashing purposes. Leaving to other lines the glory of having in their fleet a racer that crossed the "pond" a few seconds faster than any boat, the International evinces no inclination at present to materially increase either the size or the speed of their boats.

In 1770 the navigable depth of the Clyde near the Broomie-

law, or harbor of Glasgow, was only 3 ft. at high water. But now such vessels of the Anchor Line as the Columbia—drawing fully 24 ft. experience no difficulty in making the principal port of the "Land of Cakes." An official of this company stated that the Columbia had nine watertight compartments, and six decks—named respectively—'tween, main, upper, bridge, promenade, and flying bridge decks. The main saloon is on the upper deck, and artistically decorated. A passenger expressing delight at the pleasing effect of this saloon's ceiling may be told—as I was—that it is done in "lincrusta" and lincrusta is certainly pleasing to the eye however harshly its name may grate on the ear. The Anchor Line owns thirty odd steamers. Half a dozen of these trade regularly between New York and Glasgow. Ten boats are in the Mediterranean service, plying between New York and Naples, and the remainder of the fleet sails from Glasgow and Liverpool to Bombay, Karachi and Calcutta. Besides the Columbia two similar steamers—the Italia and the Caledonia—have lately been added to this line.

Though only comparatively recently taking a prominent place among the powerful nations, and handicapped by a scarcity of harbors Germany has succeeded in causing even England to anxiously watch her laurels. And the most magnificent steamers of the North German Lloyd ply between their home ports and the country that has absorbed so many German subjects. In the advertising literature of this line one notices that their fast steamers are called "Schnell-Dampfer," or Express steamers, to distinguish them from others of the line which, though sufficiently speedy to suit even the most "blase" of travelers, have to be satisfied with the common appellation of passenger boats. The Lloyd's steamers, though having Bremen painted on their sterns to indicate their hailing port, cannot proceed farther up the river Weser than Bremerhaven. At the latter place special trains meet all incoming boats to convey passengers and baggage to their destination. The fast twin-screw express steamer Kaiser Wilhelm II. is on the company's New York, Plymouth, Cherbourg and Bremen route.

Heinrich Heine once said that he dreaded the advent of the time when men would be working like machines and machines like men. With German thoroughness the routine work on board the Lloyd's steamers is suggestive of the proverbial clockwork, and on no other steamers could an observance of the crew at their several tasks give more conclusive proof that the time so dreaded by the German poet has come at last. As might be expected on boats of a nation that is the personification of militarism the discipline, drilling of the crew, and minor incidents noticeable along their decks give the chance visitor instinctively the impression of being on a man-of-war that is only temporarily pursuing a peaceful calling. As an indication of the fact that the managers of the North German Lloyd believe in the truth of the saying that ships' officers are not born but must be made, this firm decided to engage in the manufacture of the accomplished "Steuermann" from the best crude material obtainable along the shores of the Baltic. Two training ships, owned by the Lloyd, are able to turn out a sufficient number of embryo captains to fill all the vacancies that may occur in mates' berths on the 100 odd steamers.

It is certainly appropriate that steamers under the Dutch flag should ply between Holland and the city the Hollanders founded. And the immense modern steamers of the Holland America Line nowhere reveal the suspicion of a hint of the Dutchman's fall from former maritime supremacy. The directors of the Holland America Line, of Rotterdam, are expecting soon to receive a new steamer that was some time ago ordered from the Belfast ship building firm of Harland & Wolff. Said addition to this already fine fleet will be of the following dimensions: Length, 600 ft.; beam, 68 ft.; depth 18 ft. Intended to furnish accommodations for 450 first-class, 250 second-class, and 1,200 steerage passengers the new liner will be of 17,000 tonnage and cover the distance between New Amsterdam and old Rotterdam at the rate of 17 miles per hour.

Among the numerous steamers of all sizes and descriptions that incessantly pass Sandy-Hook comparatively few display the stars and stripes over their stern rail. To fly this flag from the fore truck is simply a matter of courtesy, and the colors displayed aft only are indicative of a craft's nationality. Any one in New York shipping circles if requested to name an American steamship company whose steamers compare favorably with those of foreign birth would unhesitatingly answer: "The Ward Line." The fleet of this line aggregate about 75,000 tons. The company's boast of their ships being expressly built for this service may be better understood when it is known that they trade between New York and Cuba. In other words—maintaining a passenger service between a country where the climate for many months is arctic in its severity and one where cold weather is unknown these American steamers, besides being perfectly ventilated, something essentially needful in the tropics, are also provided with well heated cabins to insure the passengers' comfort while north of Cape Hatteras. The company's chief steamer is the Morro Castle 400 ft. long, 50 ft. beam, and is guaranteed to maintain an 18-knot gait during the entire trip. Besides the Morro Castle, the latest addition to the fleet, the Ward Line owns nineteen staunch and strongly built steamers. No changes are in contemplation at present, and while German and English greyhounds struggle for the speed record, or another firm is proud in the consciousness of possessing the largest craft, the Ward Line lives up to its world wide reputation of having the best cuisine afloat. A countryman once visiting a large city saw the following notice on the advertising board of a restaurant:—"Breakfast from 7 a. m. to 10 a. m.; Luncheon 11 a. m. to 3 p. m.; Dinner 4 p. m. to 7 p. m. And ever since this countryman has wondered how city folks find time to work when so many hours are daily devoted to eating. On the Ward Line it is the rule, not only to set an exceptionally good table, but to have what is known on this route as a continuous table service. From surroundings suggestive of Polar seas to the atmospheric charm of a land of perpetual spring is no longer a far cry. The Morro Castle, for instance, requires only a little over two days to make the trip from New York to Nassau.

## SHIP BUILDING DURING FEBRUARY.

The Bureau of Navigation report forty vessels of 15,208 gross tons were built in the United States and officially numbered during the month of February, 1904, as follows:

| | Wood Sail | | Wood Steam | | Steel Steam | | Total | |
|---|---|---|---|---|---|---|---|---|
| | No. | Gross | No. | Gross | No. | Gross | No. | Gross |
| Atlantic and Gulf | 13 | 5,298 | 9 | 414 | 3 | 3,209 | 25 | 8,921 |
| Porto Rico | 1 | 22 | . | ..... | . | ..... | 1 | 22 |
| Pacific | 1 | 728 | 2 | 42 | . | ..... | 3 | 770 |
| Hawaii | . | ..... | . | ..... | . | ..... | . | ..... |
| Great Lakes | . | ..... | 1 | 44 | 1 | 4,787 | 2 | 4,831 |
| Western Rivers | . | ..... | 9 | 664 | . | ..... | 9 | 664 |
| Total | 15 | 6,048 | 21 | 1,164 | 4 | 7,996 | 40 | 15,208 |

The largest vessel included in these figures was the Edwin F. Holmes, launched at Lorain.

The composite ferry steamer which the Polson Iron Works of Toronto has completed for the North Vancouver Ferry Co., has been shipped, and it is expected will be in service in a couple of months. Her dimensions are: Length, 148 ft. over all; 28 ft. molded beam; 45 ft. over guards; 12 ft. 5½ ins. deep, and will have a draught of 6 ft. She will have accommodation for 600 passengers.

## COMMERCIAL POSSIBILITIES OF PANAMA CANAL.

FROM THE EUROPEAN STANDPOINT.

By Benjamin Taylor of Glasgow.

The civilized world is to be congratulated on the fact that the construction of the Panama canal is about to be undertaken by the United States as a federal enterprise. For it can now be recognized that a work of vast international importance, and of great commercial significance, which has been the dream of centuries, will be actually completed and maintained under an effective administration. Of the engineering and political aspects of the scheme I have nothing to say here, except this, that while ample consideration seems to have been given to the engineering features of the problem, too little has been given to the not less important features of operation and maintenance. It is not the cost of construction that will dominate the traffic for the waterway, but the method, cost, duration and risk of transit. And the risks of transit include the climatic conditions of Isthmian America upon the several cargoes carried. The present writer has elsewhere expressed the opinion that the commercial value of the Panama canal has been somewhat exaggerated. To this opinion he adheres—great as may be the necessity for the construction of the waterway.

The Panama canal will, of course, be of more strategical value to the United States than of commercial value to any of the nations. But it will also be of more commercial value to the United States than to any other nation. Whether it will be of any great commercial value to Great Britain, or that she will derive any benefit at all from it except in the general enlargement of the world's commerce, is an open question. In its commercial aspects this canal is widely differentiated from the canal across Suez. The Suez waterway connects two vast and thickly populated land areas. The Panama canal will connect two wide oceans. East of Suez are the peoples of Asia, waiting with their produce for the markets of Europe; west of Suez are the workshops of the world. East of Panama is the broad Atlantic separating the canal from the workshops and markets of Europe; and west of it are 6,000 miles of ocean sprinkled with a few unconsidered islands. One cannot, therefore, forecast from Suez the future of Panama, for there is no basis of comparison.

The primary object of an inter-oceanic canal is to save distance. Whatever traffic can find shorter routes than Panama will not use the canal. Such traffic is nearly the whole of the commerce between Europe and Asia and Africa. For instance, from Plymouth to Singapore is 7,400 miles, and to Yokohama 1,700 miles, less by Suez than by Panama. From Plymouth to Sydney, N. S. W., is 1,200 miles less by Suez than by Panama. From England to Wellington via the Straits of Magellan is 11,700 miles. Via Panama there would be a saving of 640 miles, but at what cost in canal dues? Only a comparatively small proportion of the trade to and from Europe and the Eastern hemisphere can find any advantage in the Panama route, and that advantage will be qualified and may be cancelled by the canal dues.

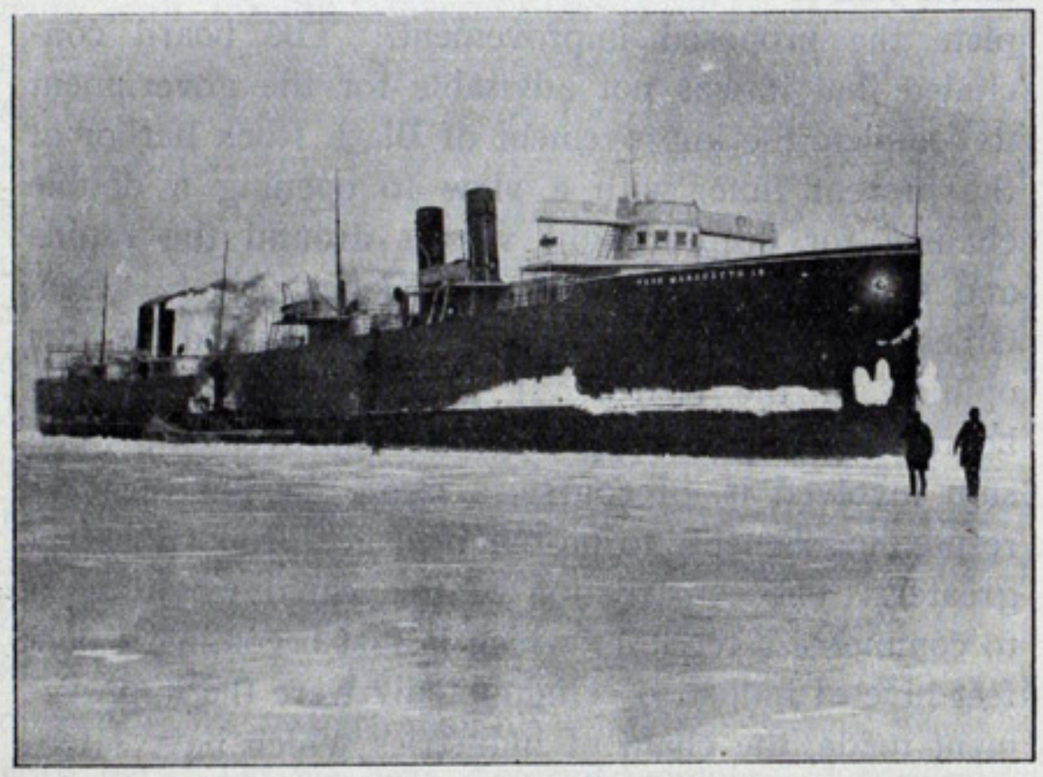
If instead of east and west we regard the relations north and south the prospect alters. The Panama canal will connect the busy workshops of the eastern states of North America with the commercially embryonic republics of the western side of South America. It will connect the Pacific states of North America with the eastern republics of South America—though it is doubtful if much interchange of traffic will result. California and Argentina are competing wheat and meat producers, and neither country has much that the other wants. The main point is that the commercial wants of the western side of South America are at present almost exclusively supplied from Europe; in future they will probably be supplied through the canal from the United States. Again, it is probable that when the canal is completed every pound of cotton required by the growing industries of Japan will be supplied from the southern states of the American union; but will America have any cotton to spare in future years? There can be little doubt, however, that the coal of West Virginia and the iron of the southern states, will have opened to them by the canal wide markets from which they are at present excluded.

The extent, as we say, to which British trade will benefit by the canal is very problematic. For Europe generally the gain will be a nearer route to the Pacific shore of North and South America, to the South Sea islands, and partially to New Zealand. To Canada the canal will naturally be of first rate importance when she is more industrially developed. At present, however, her exports are mainly agricultural, and find their market almost entirely in the United Kingdom or the United States. The reduction in distances is all in favor of the United States. But the change in many instances produces a complete reversal of the advantage which British trade at present enjoys. By the Suez canal England is closer than the United States to Australia, China and Japan, by about 2,700 miles. By the Panama canal the cities of the Atlantic seaboard of North America will be only 1,000 miles further than this country from Hong-Kong and Central China; and they will be upwards of 1,200 miles nearer the northern ports of China, Korea and Japan; 2,700 miles nearer to the western ports of South America; 1,300 miles nearer to Melbourne; and more than 3,000 miles nearer to New Zealand.

The report of the Walker commission admitted that the published conclusions as to the industrial effects of the canal are based on premises which are disputed. It was asserted that the canal will assist a wide range of industries, agricultural, mineral, lumbering and manufacturing, and we have noted some of the directions in which development may take place—to the advantage of the United States. Whether the waterway will do very much to extend the connection of the Northern and Central states with Australasia and the orient is not very clear; at the same time it is well to note that at present the greater part of the trade between the United States and China is conducted via New York and the Suez canal, and that America has a good seventh of the foreign trade of China. The future market there for iron and steel manufactures and textiles is illimitable. But as regards the general expectations of the results of the canal, these are largely founded on the belief that all the traffic at present following all the avenues of commerce that might converge on the Isthmus will necessarily use the canal. But that will not happen. It is extremely unlikely, for instance, that all the wheat and nitrate and guano that at present find their way from Pacific America to Europe round the Horn will come by the canal. The greater portion of this commerce is conducted by sailing ships, which will not use the canal, and which it is a popular error to suppose will ever be driven altogether off the face of the ocean by the steam tramp.

The Nicaragua Canal Construction Co. in 1894 estimated an annual traffic of 9,933,000 tons. The Walker commission added up all the European and American tonnage crossing the oceans in 1899, that might have used the canal had there been one, and they could not bring out a larger total than 6,702,540 tons. The tonnage of the vessels carrying that traffic was estimated at 4,074,852 tons, net register. This is not a large tonnage on which to levy transit tolls, but it is estimated that by natural increase and development the total will reach 7,000,000 tons in 1914 and 11,375,000 tons in 1924. That will, of course, depend very much on the amount of the tolls levied, and the amount of the tolls will depend on the ultimate cost of the waterway—which, it may be taken for granted, will greatly exceed the estimates, as is usual in such undertakings. It is doubtful if, even at lower transit dues than Suez, the American canal will ever attract much of our trade with India, China and Australia, but it will bring these markets 1,000 to 3,000 miles nearer to the Atlantic ports of America.

In estimating the possible tonnage that will use the canal an error is made in counting upon the entrances and clearances recorded at several ports. It is forgotten that thus the same tonnage is reckoned two or three times over. To take one instance, Punta Arenas, in Costa Rica, has been credited with an annual tonnage of 320,000; yet the actual total of its whole export and import trade of the port does not exceed 12,000 tons! Then the steamers of all the American and British lines trading with both coasts of South America call at several ports each voyage and are figured in the tonnage of each port. Some, but not sufficient, allowance has been made for this in the general estimate. Again, the exports of Chili are about 1,500,000 tons per annum, but 1,350,000 tons of that are nitrate, and over 1,000,000 tons per annum of the nitrate are, and probably always will be, carried by sailing vessels which will not use the canal. Nearly all the exports of the west coast of North America to Great Britain are by sailing vessels. It is doubtful if all the traffic from which the canal can draw much exceeds 5,000,000 tons and probably one-half of that is carried by sailers. Trade is constantly growing, of course, and South America is as yet an industrial desert compared with what it ought to be. But while the canal will, in many respects, be a benefit to the world and, therefore, in the interests of commerce, its commercial value will not be so great as is commonly supposed.



PERE MARQUETTE NO. 20 TAKING CARS OFF NO. 19.

## REPAIRS TO PERE MARQUETTE NO. 19.

One of the biggest wrecking jobs in years at the harbor of Milwaukee was completed when the stranded car ferry Pere Marquette No. 19 was freed from the reef at Fox Point, Feb. 19, after thirteen days of hard work that cost upwards of $20,000. The work of repairing the ferry, which is now in the south dock of the Milwaukee Dry Dock Co., will cost another $40,000, according to Supt. W. L. Mercereau of the Pere Marquette Steamship company, who superintended the wrecking. The boat will not leave the dock until May 1.

The work of releasing the ferry was severely hampered by stiff, icy winds, and the heavy ice floes which were packed tightly about the stranded boat. It required four heavy pumps to free its watertight compartments of the water that had flooded every one of them, and then it took the combined pull of its sister car ferry Pere Marquette 20, the most powerful on the great lakes, and of the ice crushing tugs William H. Meyer, Welcome, and George D. Nau, in addition to a 14-in. rise in the water, to get it off the reef. Without the rise in the water, says Supt. Mercereau, the wreck must have been jacked from the rocks. The picture shows car ferry No. 20 taking the load of six cars from the stern of its sister ship, while the latter was still on the rocks.

Examination of the wreck after it had been put into dry dock, showed that about twenty of the 1-in. plates on its bottom would have to be replaced, and that about thirty more must be removed to permit substituting new 12-in. beams for the seven frames that had been broken by terrific force of the boat as it struck the reef, while running 12 miles an hour.

## CAR FERRY SHENANGO NO. 1 BURNED.

Car ferry Shenango No. 1, which has been imprisoned in the ice just outside of the harbor of Ashtabula, was totally destroyed by fire last Friday. Chas. McArthur, a fireman, was suffocated in the smoke. All the other members of the crew escaped, although Chief Engineer Thomas Morrill was

CAR FERRY SHENANGO NO. 1 BURNING.

so severely burned that he had to be taken to the hospital. Three or four boiler workers were engaged in making repairs on the Shenango and were at work in the boiler room when flames were observed coming from the oil room adjoining. Chief Engineer Morrill instantly endeavored to arouse McArthur, who was sleeping in his berth next to the oil room, but though he pounded frankly on the wall of the room, he was unable to awaken the sleeper. Meanwhile his face and neck were terribly burned. As it was useless to fight the fire, the first energies of those on board were bent to saving what property they could. Thirty pounds of dynamite on the upper deck were immediately moved to a place of safety. The vessel was headed towards the southwest and so the stern was open to the strong northeast wind which was blowing at the time. The flames were quickly fanned into fury and in a very short space of time involved the whole boat. It was thought that it might be possible to sink the vessel and thus put out the fire and save the hull. To this end a hole was cut in one side of the vessel and a charge of dynamite inserted, but without the desired result, however, as the ice held her hull firmly. The Shenango had on board twenty-six empty cars, of which all but four belonged to the Bessemer railroad. The car ferry was 300 ft. long, 55 ft. beam, equipped with triple-expansion engines and four Scotch boilers. She was built at the Craig ship yard, Toledo, in 1895, for the Detroit & Lake Erie Railroad Co. Subsequently the Shenango was taken over by the Pere Marquette railroad.

The Empire Ship Building Co. of Buffalo has received an order from the Lehigh Valley Transportation Co. for the construction of a large new steel lighter for that company. The lighter is to be finished by June 1. It will be 105 ft. long, 28 ft. beam and 8 ft. moulded depth, and will be self-propelling. It will be built of steel. The purpose is to operate it in the package freight business in the Chicago river.

DEVOTED TO EVERYTHING AND EVERY INTEREST CONNECTED OR ASSOCIATED WITH MARINE MATTERS ON THE FACE OF THE EARTH.

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MARCH 17, 1904.

In the article which Col. Thomas W. Symons, government engineer in charge of public buildings at Washington, contributed to the last issue of the Review, he says that the state of New York showed a magnificent spirit in voting to expend the enormous sum of $101,000,000 in the improvement of her canals without asking the general government to contribute a penny. The only request the state of New York makes of the general government is that the Niagara river from Lake Erie to Tonawanda be properly improved to enable it to be used in connection with the barge canal in a satisfactory and adequate manner. By enlarging the existing Black Rock canal and building a ship lock it will enable the ships of the Great Lakes to utilize the splendid natural harbor of the upper Niagara river for general commercial purposes and enable the Erie canal proper to terminate in the Niagara river at Tonawanda and then use the river to connect lake Erie and the upper lakes. Col. Symons thinks that all lake carrying interests should unite with New York in asking the general government to improve the Niagara river as indicated.

When Col. Symons was in charge of the harbor of Buffalo, he made a preliminary examination and survey for the construction of this canal. The work was taken up by his successor, Maj. Theodore A. Bingham, and the report has now been completed. Maj. Bingham has presented a detailed plan for improvement which contemplates the execution of a channel 23 ft. deep, varying in width from 250 to 500 ft. and provided at the lower end of the harbor near the foot of Squaw Island with a lock opening into Niagara river below the shoals and rapids. The work proposed involves the removal of the existing wall of the Erie canal and the merging of the waters of the canal with those of Black Rock harbor along the greater part of the proposed channel. The estimated cost of the plant presented is $3,473,239, which includes the acquisition of certain state and private property. To enable vessels of all classes engaged in commerce to pass from Lake Erie into the natural harbor of Niagara river below the shoals and rapids, there would be required, in addition to the work provided for in the above estimate, the excavation to a depth of 23 ft. and a width of 400 ft. of the eastern channel of the river below the lock for a distance of 2½ miles, the cost of which would be approximately $500,000.

The board of engineers for rivers and harbors to which Maj. Bingham's report was submitted, estimates that it would require at least $4,500,000 to complete the proposed improvement. The board concluded that it was not advisable for the government to complete the improvement of Black Rock harbor at the present time, with a view to opening a double channel for deep-draught vessels around the rapids and shoals at the head of the Niagara river. Gen. Gillespie, late chief of engineers, concurred in this opinion of the board. It is unfortunate that the board should have opposed this improvement. The sum involved is, of course, a large one but the corresponding benefits to be obtained are proportionately greater. The construction of this canal would open to commerce a territory which is fast becoming a perfect hive of industry. Undoubtedly were the improvement made, the chain of industries which have lately been established at Buffalo would extend all along the water front to Tonawanda. In other words, it would have a tendency to make the division between Buffalo and Tonawanda more political than geographical. It would also vastly extend the influence of the Erie canal. Surely if one commonwealth in the United States is willing to expend $101,000,000 to improve its waterways, the federal government ought not to halt at $4,500,000 which would widely extend the benefits to be derived from the greater sum.

If there is one thing more than another that a government engineer should rid his mind of it is the fact that there exists a combination among the lake dredging interests. Combination is the bugaboo wherewith the government engineer has scared himself for a great many years. Naturally there can exist no combination in such a business as dredging. The moment profits advance beyond a reasonable figure competition is immediately invited. It would, of course, be different if there was such a thing as monopoly in

dredges, but there cannot be any monopoly in an article which scores of firms can produce. The fact that for a dredging contract in St. Mary's river, involving something like $2,500,000, there should have been no competition whatever proves clearly that there is no such thing as a combination among the lake dredging interests.

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The United States stands pre-eminent among the nations of the world in industry, commerce and finance, and it is conceded the world over that protection has produced the conditions that are so greatly to our advantage, just as free trade has produced the shrunken and decayed condition of our deep sea merchant marine. Some people think we should remedy this condition by giving American registry to foreign-built ships. But how ridiculous this suggestion is! In the first place Americans now possess a vast fleet of foreign-built ships that they have been able to purchase on the same terms as their foreign competitors have purchased their ships, and these American owners of foreign ships are able to run them under foreign flags with foreign officers and crews as cheaply as their foreign competitors run their ships. So circumstanced American owners of foreign vessels earn as large profits upon their vessels as their foreign competitors do. But if they should place these vessels under American registry, and be compelled, as they at once would be, to employ American officers, and to conform the victualling of the ship according to the American food "scale" at an expense about 35 per cent. greater than their foreign competitors are subject to, where would there be any advantage in such a change? Why should an American owner accept for his foreign ship an American registry when such registry involved him in so much greater an expense in operating his vessels that he could not earn a profit with her? Do we hear American owners of foreign ships pleading with Congress for American registers for them, in order that they may thus engage in our foreign trade? There is not one voice so raised; all of those who own foreign vessels for which they seek American registry are merely seeking to invade our coastwise trade, a trade that for more than a century has been exclusively reserved for American vessels.

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An extremely unpleasant, and in fact disastrous, possibility confronts the United States, in the development of the war between Russia and Japan. If the great powers of Europe should become involved, an immediate and enormous demand would arise for transport service, and the foreign ships upon which the United States now depends for the carriage of its exports would be suddenly and ruthlessly withdrawn. This would be followed by a large increase in freight rates, due to war risks, high insurance, and other dangers incident to war, and rates would soar still higher, due to the difficulty of securing vessels, even at any price. The effect of this would be to deprive the people of the United States of many foreign markets for their surplus products, as the cost of reaching those markets would entail a loss upon the exportation of the products.

When the war between the British and the Boers broke out, such a large amount of British tonnage (some 600,000 gross tons) was at once withdrawn from the different highways of commerce that freight rates at once rose 30 per cent. the world over, for ocean transportation. But that increase was as nothing in comparison with the increase that would surely follow the embroilment of Great Britain, France and Germany in the war between Japan and Russia. And yet, such an embroilment is by no means an improbability—it has been sufficiently considered to induce extremely conservative people to take out insurance at Lloyds against it.

If ocean freight rates should advance 50 or 100 per cent., as a result of a vast amount of British, French and German shipping being required for military and naval purposes, the United States would be a great sufferer, and then our people would begin to realize what it means to be wholly dependent upon foreign shipping for the carriage of more than 90 per cent. of our exports and imports. There would be such a reduction in the extent of the foreign markets then available for our products that we should at once find a greatly restricted production enforced upon our people. That would be followed by a reduction in the amount of employment, and this would be followed by rapid reductions in the rates of wages, all this still further restricting the consumption of our products within our own borders, and again that would still further diminish production, and so it would go on. The country would suffer all of the evils of the most severe bad times, the era of soup houses and charitable aid for the unemployed and the hungry would be ushered in to take the place of our present prosperity.

It is an evil so serious, this almost complete dependence upon foreign shipping for our export carrying, that we should make the most extreme sacrifices to be free from it. It is a duty that the nation owes to its people to safeguard them against such calamitous consequences as these to which we have referred. It is one that our statesmen can, and should be compelled to, provide against. There should be an ample supply of American ships with which to do all of our ocean carrying, and there would be if Congress would but do for the shipping industry what it nearly a half a century ago did and ever since has done for our great farming and manufacturing industries, in the way of ample, adequate and generous protection against foreign competition.

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The citizens of Detroit tendered a reception last week to Mr. Frank J. Hecker, a member of the Panama Canal Commission.

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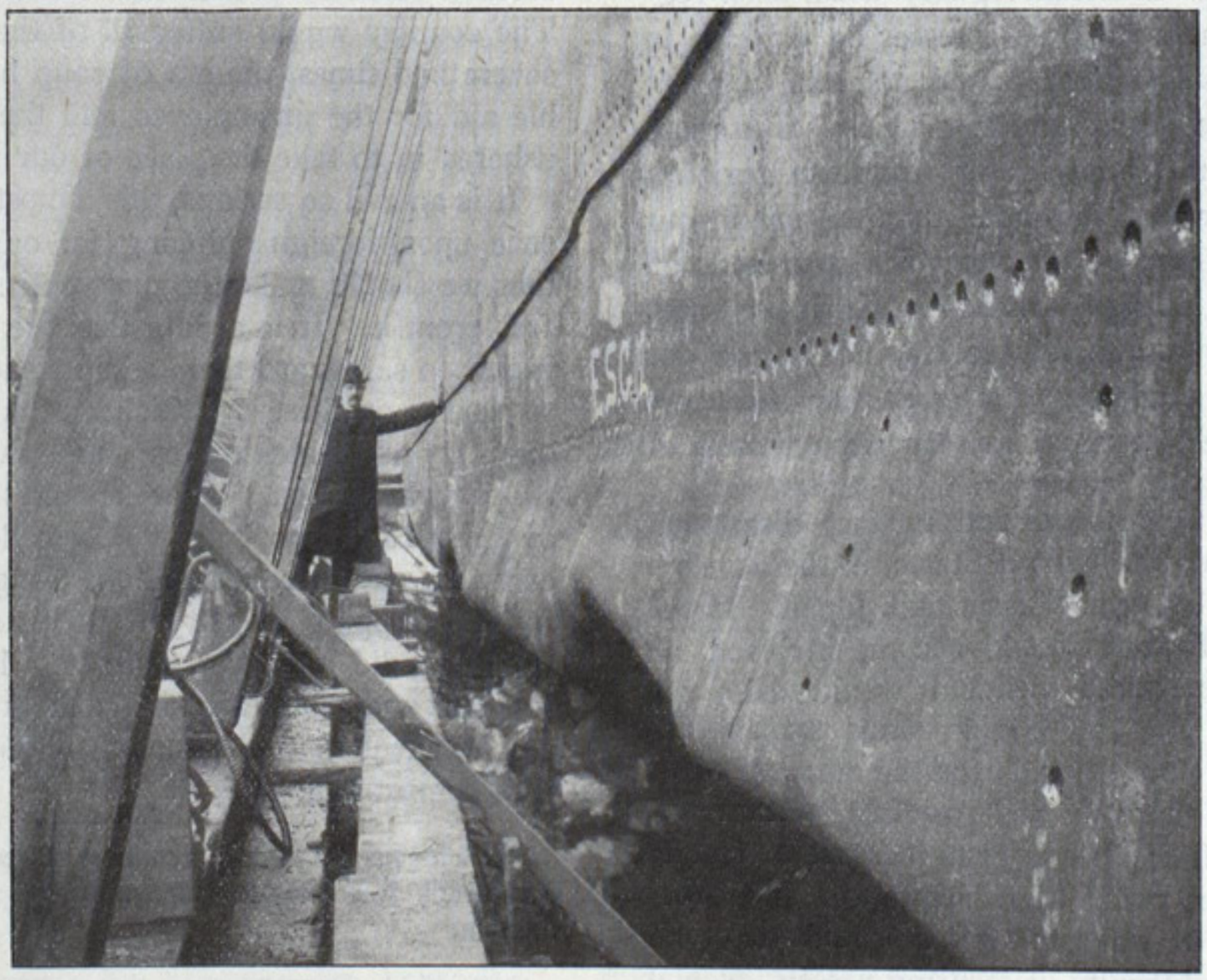
Capt. D. J. Duncanson of the steamer Langham will sail the steamer Geo. L. Craig the coming season.

## STEAMER HUTCHINSON IN DRY DOCK.

Buffalo, N. Y., March 16.—The steamer Hutchinson, the same which battled against the frozen seas at the beginning of winter and made a trip down the lakes that will ever be memorable in the annals of lake traffic, was placed in one of the docks of the Buffalo Drydock Co. a few days ago. They just got the Hutchinson in the dock in time, for the next day the place was frozen over. Otherwise the repairs that are now being made to her would not have yet been started. The Hutchinson, it will be remembered, was the vessel that struck 5 miles above Eagle River in Lake Superior on Nov. 29, 1903, and then finished the trip to Buffalo under most dangerous and exciting conditions.

BOTTOM OF STEAMER JOHN T. HUTCHINSON SHOWING WHERE SHE STRUCK ON PINNACLE REEF.

It cannot yet be stated, even at this day, just what is the extent of the damage suffered by the Hutchinson and for that reason it is impossible to say just how much money will have to be spent to put the vessel in her former condition. A statement by Mr. Warren, one of the experts at the Buffalo Drydock Co., is to the effect that it has been estimated that the expense of the repairs may run anywhere from $60,000 to $115,000. "It cannot yet be told," said Mr. Warren, "just how much damage was suffered by the Hutchinson. We have learned everything that happened to her so far as we can tell with the boat in its present condition. But as the work of repairing her goes along we may find damage that has not yet been discovered and for that reason it is impossible to say just what the repairs are going to cost. Then it is possible that some of the plates that are to be taken off and re-rolled may break and that means new plates."

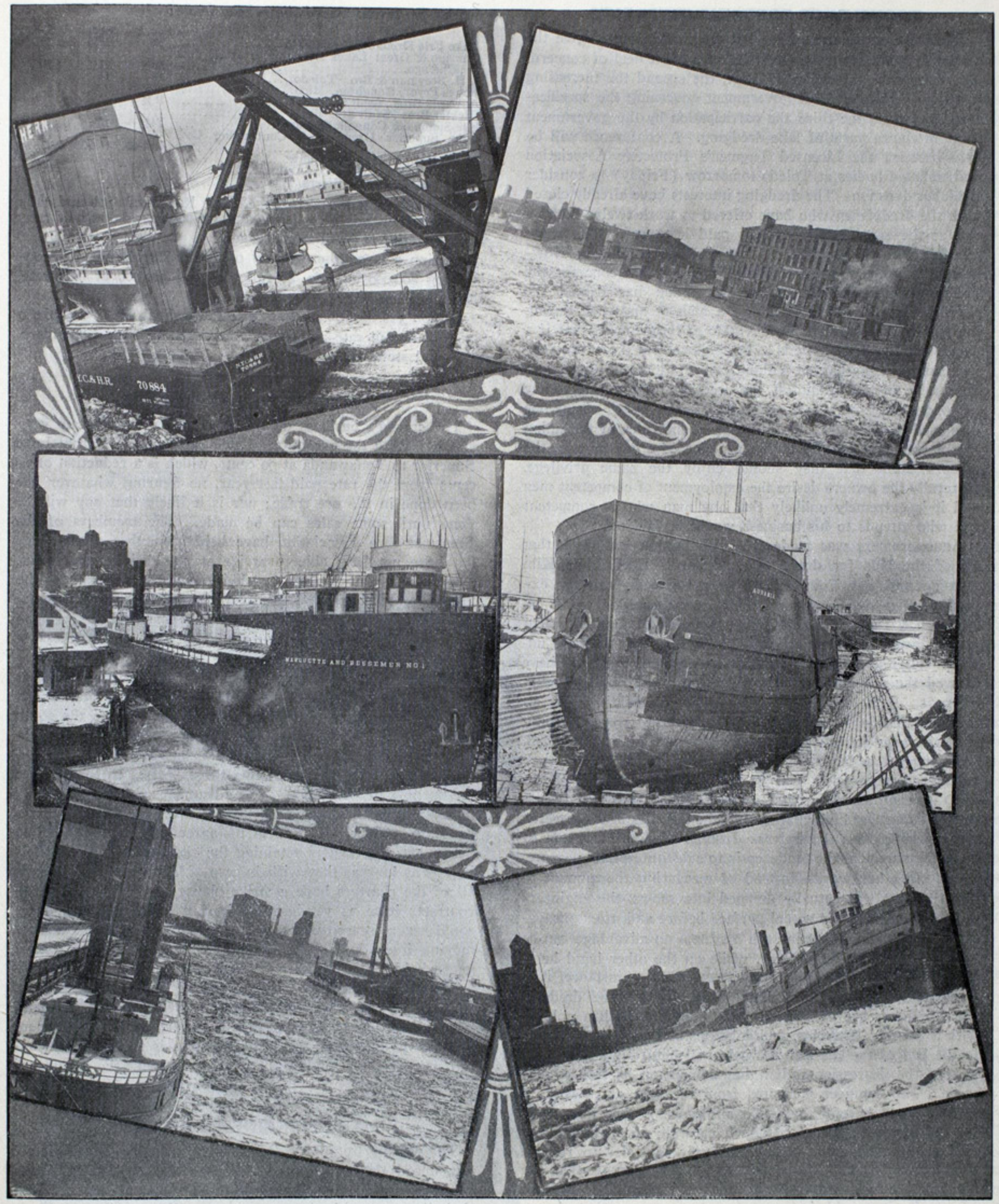


BATTERED BOTTOM OF THE STEAMER JOHN T. HUTCHINSON.

A survey of the patent damages to the Hutchinson has been made by Henry Saulter and J. A. Wiesbeck, in the interests of the underwriters, Adam Steel and the owners. The surveyors report, in substance, that there is evidence that the Hutchinson stranded on a rocky bottom and that the most serious damage was suffered on the starboard side, extending forward to aft amidships.

It is now estimated that the total number of plates that will have to come off is eighty-seven, about half of which will have to be furnaced and put back. Over forty plates will have to be renewed entirely, while several must be faired. Most of the plates that are to come off are 28-ft. plates and the number is larger than have been taken off a boat in many years, with the exception of the steamer Harlem. In the case of the Harlem, however, the plates were 14 ft. Ninety-seven of them were taken off. The cost of repairing the Harlem was about $120,000.

The Hutchinson's windlass bed plate was found to be cracked. The port side anchor fluke was broken. It is yet to be ascertained whether the starboard anchor chain was lost. The deck engines are to be overhauled and the piping is to be improved. Parts of the steering apparatus also have got to be overhauled. The Buffalo Drydock Co. also has another job on the Hutchinson, not entailed by the damage done on her memorable trip, and that is to move the hatch stanchions back and make certain changes in deck beams. The vessel is due for a long stay in the drydock because, as stated before, damage may come to light which has not yet been discovered and which can be found only as the work of making repairs progresses. The Hutchinson is at present the only




WINTER SCENES IN THE HARBOR OF BUFFALO—FIRST PICTURE OF THE NEW COLLIER PERE MARQUETTE AND BESSEMER NO. 1.

vessel in the drydock here, but the company has a big load of work on its hands. The jam of ice, however, keeps it from getting the boats into the drydocks. As soon as it is possible, however, they will be taken in. The vessels at present scheduled for repairs are the Mauch Chunk, C. M. Warner, L. C. Smith, City of Bangor, Yosemite, Wilkesbarre, Polynesia, J. B. Cowle, Troy, Nellie Riddington, L. P. & J. A. Smith dredge, a Great Lakes dredging scow, the Lewiston, Boston, Sevona, Milwaukee, Robert Mills, Codorus, J. B. Ketchum, Gordon Campbell, India and Japan. The biggest job is that on the L. C. Smith, although there is always a possibility that new work on any boat may be found while repairs are being made.

## TROUBLES OF DREDGING INTERESTS.

Various circumstances have latterly contributed to give the dredging interests on the Great Lakes a great deal of concern. The first is the condition of labor, the second the increasing exactions of the Federal government governing the specifications for work, the third the participation by the government itself in choice parts of lake dredging. A conference will be held between the Licensed Tugmen's Protective Association and affiliated bodies at Toledo tomorrow (Friday) to consider the labor question. The dredging interests have already closed with the dredgemen who have offered to work twelve hours a day at the same rate of wages paid last year. The wage schedule with the tugmen has not yet been arranged. However, it is not alone the schedule of wages that concerns the dredging interests. The Tugmen's union has denied the right to the owners to discharge a man at any time during the year. They want it made a part of the compact that if a man is employed at all, he is to be employed for the entire year and cannot be discharged without consultation with the union. In case he should be laid off, the dredging interests are to pay his wages while he is laid off as well as the wages of any one employed in his place. As it is one of the rules of the union that a man may quit by giving a notice of a day or two, the owners think that they should enjoy the same privilege. Naturally the owners desire the employment of competent men and it is extremely unlikely that any man who is competent and who attends to his business would be laid off.

Announcement was made from Wellington last week that all of the bids for dredging at Ballard's Reef, Lime Kiln crossing and Bar Point shoals were rejected, with the exception of a single proposal which was accorded to G. H. Breyman & Bros. of Toledo, upon their bid of $430,625. The reason given for the rejection of the bids is that they are unreasonably high, and, as usual, the government engineers have revived the old scare of a combination among the dredging interests. It is known that there is no combination. As an evidence of this, McArthur Bros. of Chicago were the only bidders on the job of removing the rock in the West Neebish, involving an expenditure of $2,500,000. The bid for rock (about 1,500,000 yds.) was $1.36; for earth (about 185,000 yds.) 56 cents; and for face of wall, $5.50. The real reason for the somewhat high character of the bids lies in the government specifications themselves. Instead of the old system of scow measurement the tendency is to substitute place measurement. In other words, instead of measuring the amount of material that was actually dumped into scows, the engineers desire to measure the actual surface before and after excavation. It is obvious that in such a system no advantage can be bestowed upon the contractor, while on the other hand he is likely to suffer numerous disadvantages. For instance, it is impossible to measure absolutely the space to be dredged. Measurements are usually taken by sounding with a pole or with a weight. Thereby, if undulations or irregularities occur in the bed of the channel, the pole will naturally slide to the base of the depression rather than remain on its side or pinnacle. The engineer measures from the base and desires a certain depth beyond that. No allowance is therefore made for the removal of material which naturally in an undulating surface lies above the base. Moreover in order to remove rock to a certain depth it is necessary to remove more than the amount specified. Naturally in order to blast rock to a depth of 21 ft. it would be necessary to go somewhat deeper than 21 ft. in order that at least 21 ft. might be secured throughout the whole channel. For this additional work no allowance is made. It is, therefore, to cover the added exaction of the place measurement system that the bids were somewhat higher than they would be under the scow measurement system. There is no such thing as a combination of dredging interests on the lakes. The following bids were opened last week by Maj. W. L. Fisk for St. Mary's river work. So far no awards have been made:

| | Sec. 1 | Sec. 2 | Sec. 3 |
|---|---|---|---|
| Lake Erie Dredging Co. Buffalo | 18 | 13⅞ | $1 15 |
| Chicago & Great Lakes Dredging & Dock Co., Chicago | 19½ | 14¼ | 1 20 |
| J. H. Breyman & Bro. Toledo | 18 | 14 | .... |
| James Pryor, Houghton, Mich | 18¼ | .... | 1 05 |
| Edwards Bros., Sault Ste. Marie | 18¾ | .... | . |
| Hickler Bros., Sault Ste. Marie | .... | .... | 99 |
| Fitz-Simons & Connell, Chicago | 24½ | 15 | .... |
| Lake Superior Dredging & Contracting Co., Duluth | 19 4-10 | 14 4-10 | 2 25 |
| H. W. Hubbell & Co., Saginaw | .... | .... | 98 4 10 |
| Duluth Dredge & Dock Co., Duluth | 18 | 14 | 1 00 |
| Charles Simono, Two Rivers, Wis | 17¾ | .... | |

Section 1 includes part of the Little Rapids cut job and calls for 242,000 cu. yds. at full rate and 156,000 cu. yds. at half rate, soft material at bank measurement.

Section 2 is another section of Little Rapids cut job containing 800,000 cu. yds. at full rate and 300,000 at half rate, bank measurement.

Section 3 is the job at Nine Mile Point shoal, Hay lake, 56,000 cu. yds. at full rate and 25,000 cu. yds. at half rate, bowlders, clay and stone.

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## FORECAST OF LAKE TRADE.

The season's business on the great lakes is lining up very slowly. With the exception of two small charters from Lake Superior to Tonawanda at 90 cents, which is a reduction of 10 cents from the rate paid last year, no figuring whatever has been done in the ore trade; nor is it likely that any will be done until some sales can be made. The members of the Bessemer Ore Association have held a number of meetings but have not been able to arrive at any definite agreement. The interests of the two great divisions in the association—the producing consuming interests and the merchant ore men—are so divergent that it is extremely unlikely that they can hit upon an agreement satisfactory to all. The total ore business of the year is not likely to be large.

Considerable coal tonnage has been chartered at Buffalo at the same rate which obtained at the opening of navigation last year—40 cents to the head of the lakes, 60 cents to the south branch of the Chicago river and 50 cents to other Lake Michigan ports. Chartering in this trade has been quite free indeed, one broker placing twenty-three vessels to load before the opening of navigation. The advantage of loading directly into the vessel lies in the fact that it saves the expense of rehandling on dock. There is no agreement, however, as to movement, the owners retaining the right to hold the vessels in port as long as they wish in case of labor trouble. In fact, all of the charters have a strike clause in them. No season contracts have as yet been made, but undoubtedly shippers could secure season contracts at the figures quoted. Coal is moving freely from the docks at the head of the lakes. As a general thing the vessel owners are observing the wishes collectively expressed at the annual meeting of the Lake Carriers' Association that grain should not be loaded for early shipment. The outlook for the lumber trade is quite good, but the owners will do nothing until the labor question is settled. All conditions conspire, including the weather, to make the opening of navigation late.

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## MARINE ENGINEERS ON TUGS.

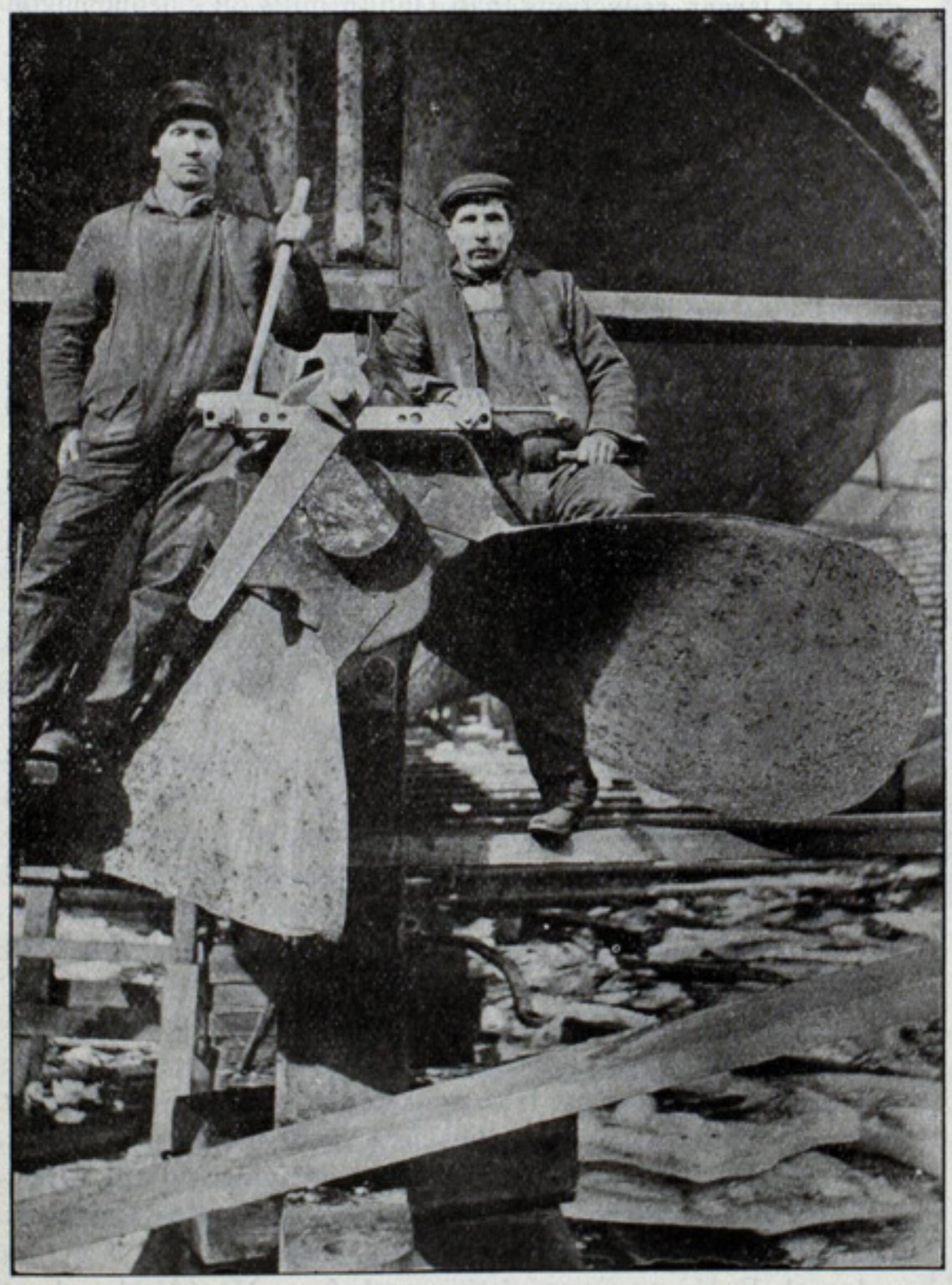
The Marine Engineers' Beneficial Association has definitely announced that all members of that organization will take positions during the coming season on any steam vessel which their licenses entitle them to operate. The meaning of this is that the members of the association will work on harbor tugs, which for a number of years have been handled by members of the Licensed Tugmen's Protective Association. The marine engineers represent that the Licensed Tugmen's Protective Association has made a constant effort to crowd members of their organizations off of the tug boats, notwithstanding the fact that the marine engineer had always had charge of big lake tugs. The matter culminated last season when the marine en-

gineers employed on the tugs Niagara, Sampson, A. J. Smith, Fisher, Ames and Favorite were notified by the licensed tugmen that if they did not join the latter organization they would have to get off the tugs. Naturally the marine engineers neither wanted to join the Licensed Tugmen's Association, nor did they want to get off the dredges. The Great Lakes Towing Co. has not as yet made any contract with its tugmen for this season, though for the past few years the licensed tugmen have had charge of their boats.

A number of the leading vessel owners are in favor of giving the engineers full charge of their department, with power to hire and discharge the firemen, oilers and water tenders. This was one of the things discussed at the annual meeting of the Marine Engineers' Beneficial Association, held in Washington in January. The engineers are especially desirous of having full control of the after part of the ship. They represent that they have had during the past year or two especial troubles with the firemen and that it was impossible to do justice either to themselves or to the owners of the vessels. It is well known that in a number of instances the firemen deserted the vessels and left the engine room short-handed. It is more than likely that the new plan will be officially endorsed by the Lake Carriers' Association next season.

## PROPELLER OF STEAMER PLEASURE.

The accompanying photograph shows the broken propeller wheel of the steamer Pleasure while in the dry dock of the Detroit Ship Building Co. While trying to force a passage



PROPELLER WHEEL BROKEN IN ICE

through ice 2 ft. thick in Lake St. Clair two blades of a 10 ft. 6-in. propeller wheel were broken off at the hub and a third was broken in two at one revolution when the steamer encountered an extra heavy piece of solid ice.

## CHICAGO GRAIN SITUATION.

Chicago, March 15.—The vessel situation for the time offering no features of interest and rates are ruling unchanged, nominally 2¼ cents@2½ cents corn and wheat and 1¾@2 cents oats for Georgian Bay and Lake Erie points. Chartering thus far is very light, some five to six vessels between Milwaukee and Chicago covering the entire winter storage business. While the figures following note stored in our elevators some 5,000,000 bu. below that of a year ago, the outlook turns favorably through our attractive market prices, for prospective good receipts of wheat and corn between this time and that which promises to be a comparatively late resume of navigating. Under substantial cash inquiry eastern grain supplies are reducing rapidly and even with normal all-rail conditions from the west, the trade seems to be working steadily toward a nearby active interest in lake shipping. Following are the stocks of grain in Chicago and South Chicago elevators:

| | This week. | Last week. | Same week last year. |
|---|---|---|---|
| Wheat | 5,607,000 | 5,667,000 | 11,229,000 |
| Corn | 8,151,000 | 7,638,000 | 8,124,000 |
| Oats | 5,604,000 | 5,056,000 | 4,677,000 |
| Rye | 328,000 | 312,000 | 806,000 |
| | 19,690,000 | 18,673,000 | 24,836,000 |

## OBITUARIES.

Walter S. Rose, one of the oldest captains on the lakes, died at Lorain last week. He was born in Lorain Co., March 13, 1834, and had lived there all his life. He followed the lakes from boyhood and had sailed on the schooners Cleveland, Twin Sister, Milan, William Shupe, Typo and Gold Hunter. Of these none is now in existence except the Typo. He retired from the lakes about eight years ago.

Capt. Robert Smith, who died at Chicago on Monday from the result of an operation for the removal of an exophthalmic goitre, was one of the best known men identified with the lake trade. At the time of his death he was president and general manager of the Duluth Dredging & Dock Co., in which concern he was largely interested financially. He was a brother of Capt. W. W. Smith, the marine superintendent of the Pittsburg Steamship Co. He was master of the passenger steamer Japan of the Anchor Line for a number of years. In 1894 he took command of the steamer Columbus. He was only forty-four years old. His death was an especially sad one. After the operation it was supposed that he would quickly recover, but a sudden tightening of a cord in his neck forty-eight hours later caused him to choke to death.

Capt. T. W. Byrns, an old resident of Painesville and a well known lake captain, died this week. He was eighty-three years old and had been sailing since he was thirteen.

## STAGES OF WATER.

The gage records of the United States lake survey show the following mean stages of water above mean sea level, for February, 1904.

| | Stages during February. | Higher than during same month last year. | Lower than during same month last year. | Higher than Feb. '95 |
|---|---|---|---|---|
| | Feet. | Feet | Feet | Feet |
| Lake Superior | 602.32 | 0.34 | .... | 0.04 |
| Lake Michigan | 579.86 | 0.01 | .... | 0.06 |
| Lake Huron | 579.92 | 0.14 | .... | 0.08 |
| Lake Erie | 571.28 | .... | 0.42 | 0.28 |
| Lake Ontario | 245.05 | .... | 0.04 | 0.63 |

Present fall Lake Huron to Lake Erie, 0.56 feet more than year ago.

The Montreal harbor commission is considering the question of having overhead tracks erected in connection with the carrying out of the extensive harbor improvements.

## OUTFITTING OF VESSELS AT DULUTH.

Nothing has been done about outfitting for the spring around the Duluth-Superior harbor. The unsettled condition of labor and the probable delay in opening have nothing to do with the slackness. The biggest jobs to be undertaken, when the ice goes out of the harbor, will be the docking of the Moore and America, of the A. Booth Co. The Moore was on the rocks on the north shore of Lake Superior last fall, and stove two big holes in her bottom and was badly hogged. Her repair job will be a considerable one. The America has been cut by ice and is in need of other repairs that require docking.

There are thirty-two Pittsburg Steamship Co. vessels in the harbor this winter and nothing but the most ordinary repairs will be carried out on them. The use of unloading machines is always hard on tank tops, and there will be some repairs along this line. The office of A. B. Wolvin has three Peavey boats, four Great Lakes Transportation and four Provident company ships, and nothing is to be done to any of them beyond the most necessary overhauling and outfitting to maintain efficiency. Two Tomlinson boats have been laid up here and they will need nothing other than overhauling. The Muncy and two Mutual Transit ships represent the package freighters here, and they also will receive as little as possible. A few other bulk freight ships are in the harbor but work on them will be of the slightest importance and the most necessary nature.

The tug fleet is in pretty good shape now and will need little other than a few dockings and some new pieces of machinery, all of minor character. The dredge fleets are to do little, indeed they have so small a volume of work in sight for the season that they do not feel justified in a very elaborate outfitting. The Lake Superior Dredging & Contracting Co. has two small contracts, one cleaning out at the mouth of the Nemadji and the other at Grand Marais, and has some other work in sight, besides some that may materialize and be more important than anything yet taken. This company did not bid for the rock and earth excavation at Nebish. The plant of the company has been kept in good condition and little needs be done now. The Northern Dredge Co., which owns a small sand sucker, has taken a contract for Port Wing work, and must add somewhat to its facilities, but this is unimportant.

Harbor contract work for the coming year is exceptionally quiet, and there is little in sight that is liable to arouse activity. It may be that the Northern Pacific road will rebuild and enlarge its No. 3 dock, lying near the elevators of the Consolidated Elevator Co., but this is not assured at present. If this work is carried out it will mean a large expenditure and much for both dredges and other plants to do. The entire dock will be torn out and rebuilt solid, filled with sand and gravel and given a floor of either heavy timber or concrete. As concrete can actually be laid here about as cheap as the mere first cost of timber, it will probably be used. The same road has in comtemplation the construction of docks along the west side of Rice's point where it did a great deal of filling two years ago, but this will scarcely be undertaken this year. There is no ore dock work in contemplation, though a little dredging will be necessary around the docks of all companies. Some coal dock extensions will be built, and a contract has already been let for part of it. There has been talk of improvements at the harbor of Grand Marais, north shore, but it is a safe guess that nothing will be done, at least not this year.

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Reports from Goderich, Ont., state that the ice is very thick on the Canadian shore of Lake Huron and extends out as far as the eye can reach. It is reported to be piled up from 20 to 30 ft. in height.

## PROBABLE LUMBER PRODUCTION.

Duluth, March 15.—Estimates of probable lumber production at the head of the lakes are being reduced as returns come in from the logging camps. It is now probable that the total cut of the year in mills on deep water at Duiuth will not exceed 265,000,000 ft. In fact the figures given below show even less and they are from the most reliable sources. The cut last year was 380,000,000 ft. and that of the year before 440,000,000 ft. This year's cut will probably be something like this:

| | |
|---|---|
| Alger, Smith & Co. | 80,000,000 ft. |
| Edwards Hines Lumber Co. | 40,000,000 ft. |
| Merrill-Ring Lumber Co. | 35,000,000 ft. |
| Scott-Graff Lumber Co. | 20,000,000 ft. |
| Red Cliff Lumber Co. | 30,000,000 ft. |
| Hubbard & Vincent | 20,000,000 ft. |
| Lesure Lumber Co. | 11,000,000 ft. |
| St. Louis Lumber Co. | 10,000,000 ft. |
| Total | 261,000,000 ft. |

These figures may be raised somewhat by outside cuts that are not known as yet or by the increase of those companies that log by rail and can always exert themselves to a little above their expectations if market conditions are right.

There were in dock at the head of the lakes at the close of navigation 85,000,000 ft. of lumber, nearly all of which was then or has since been sold. This is less than has been on dock at the close of navigation for several years.

Other lumber districts on Lake Superior will suffer as great, or larger, reductions than Duluth mills on Chequemagon Bay last year cut 370,000,000 ft. Their reduction for 1904 will be more than that of Duluth. The Iron River mills ship somewhat to Ashland, and this is their last year. In 1903 they cut 70,000,000 ft. Ashland had on docks at the close of navigation 66,000,000 ft., some of this has been going out all rail during the winter, but most like the cut at Duluth, has been sold for lake shipment at the opening of navigation.

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## PERSONAL NOTES FROM DULUTH.

Duluth, Minn., March 15.—G. A. Tomlinson, who has one boat under way this winter by the American Ship Building Co., is in the east. Mr. Tomlinson's companies have all had a very successful year.

J. G. Rose, of the Canada Atlantic Co., left on Thursday for a trip to Ottawa and Chicago on company business.

Jos. Kidd, wrecking master and expert for the Pittsburg Steamship Co., is in Denver and the surrounding mountains for a few weeks.

Capt. A. B. Wolvin and wife and Geo. C. Howe and wife have been in Mexico for some weeks, but returned to Duluth the 11th inst. Mr. Wolvin was invited to assist President Diaz of Mexico in formulating some reforms and modernizations of port, harbor and pier affairs in the southern republic and enjoyed unusual attentions from high government dignitaries while there.

Lansing R. Robinson, who has been general northwestern agent for the Union Transit Co. for several years, is selling the company's property here and retires from the company upon its withdrawal from business next month.

A. M. Marshall, who is a large stockholder in the Great Lakes and St. Lawrence Transportation Co., sailed last week from Boston on a three months' visit abroad.

Joseph F. Hayes returned this week from New York, where he laid up the lake-built ships Minnetonka and Minnewaska, which have been put out of commission.

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The steamer Francis Widlar, building for the Columbia Steamship Co. at the Cleveland yard of the American Ship Building Co., will be launched April 2.

## COAL CHARTERING AT BUFFALO—UNDERWRITERS.

Buffalo, March 15.—There is some movement in lake circles that looks to the opening of the lakes before long, though for the most part the situation is far from promising. The chartering of about 200,000 tons of coal at last season's opening rate, made by Brown & Co., is regarded as mutually profitable to both carrier and shipper. It is arranged to load the cargoes at shippers' option and to sail at owners' option. So far only Duluth, Chicago and Milwaukee have been covered. The Duluth rate is 40 cents, and the Lake Michigan rate is 50 cents, with the usual 10-cent premium to the south branch of Chicago river on account of the difficulty of navigation.

The vessel men in devising this plan have made provision for a possible tie-up at the opening of the season and have saved the coal shipper from dumping his coal from cars to the dock and picking it up again to load into the vessel. There is, of course, some uncertainty over the wage issue, but the vessel owners have shown so much disposition to resist last season's rate of wages that it is now predicted here and there that the masters and pilots will come down in their demands. There is so little show for profitable business at the outset of the season that the men may easily come to the conclusion that the vessels will remain at their docks rather than pay wages that nobody can earn.

There seems not to be a final arrangement made in regard to the grain handling at this port. The business will be done after the old fashion, but there are some questions of compensation to be settled. Even after that there is the question of the introduction of the new device that is commonly known as the Ogdensburg sweepers. This will, of course, cut down the earnings of the scoopers and is so well received here by vessel men that one of the best-posted of them said this week that he could see no reason for doubting that all the harbor elevators would be equipped with them in a short time, which of course means that most of the scoopers will be crowded out by them.

Some of the vessel men are saying that they look for a slow coming to an understanding and a final rate on the part of the underwriters. There has been no such view given out direct and the meeting of last Thursday appears to have been quite harmonious. It is true that no rates were made, but this was a Lloyds' meeting and rates are always left till another meeting. All the interests were liberally represented, nearly twenty agents being present, including several from New York, representing foreign as well as home companies. The plan, so far as it goes, is to re-establish last season's rates generally, but to change the form of policy for the wooden vessels, as they are now nearly all more than ten years old and are going to be a losing factor in the insurance business unless some special precaution is taken, and none too much money has been made of late at the best.

At the same time it is the plan to make quite a descent on the older of the steel craft during the season. For certain reasons this was not done at this winter's inspection, but it needs attention, as so many of this class of hulls are now past twenty years old, or just coming to that age. It is common to begin the reckoning for the larger steel hull with the appearance of the steamer Onoko in 1882, for though her hull is of iron she was very soon followed by the steel fleet, all brought out on account of her pronounced success as a large metal-hulled carrier.

It is assumed that the metal fleet has been well cared for and is still in its prime, but it is said that it is time to make sure of this, as was done with the older, moderate-sized iron hulls with wooden upper works several years ago. The life of the lake metal hull is not really long enough yet to indicate how long it is to be depended upon and it is possible that a thorough inspection of the fleet now will determine it to a certain extent.

The package-freight fleet, which is now Buffalo's real claim to a leading place in the vessel business, is not expected to make any more shifts right away, though the real diversity of large interests is no longer what it used to be. The great lines will continue to grow moderately and the others will stand still or go slowly out of existence, but the business will be done just as before. Buffalo feels that her commerce is secure with the prospective rebuild of the Erie canal and is pleased to find that the opposition that threatened to continue even after the vote was taken, has now apparently disappeared. There is already a good showing of new canal boats of the old size building and the remarks about the canal being dead are no longer heard. The Buffalo route is the lake route, as it is the canal route and appears to be safe.

JOHN CHAMBERLIN.

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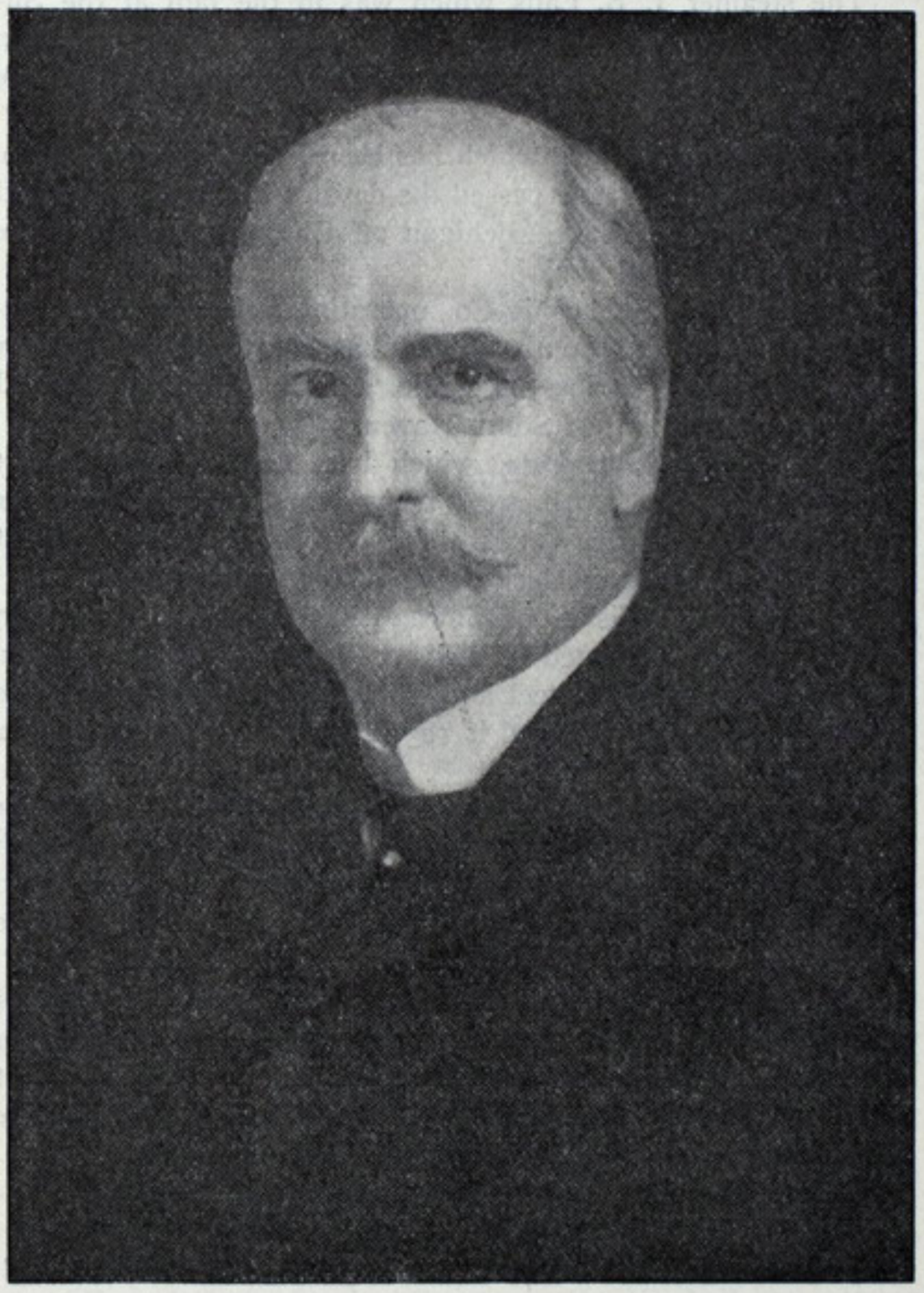
## JOHN B. ROACH.

John B. Roach has just been re-elected president of the Delaware River Iron Ship Building & Engine Works for the seventeenth consecutive time since the death of his father John Roach who was one of the most famous of American ship builders. Frank Allen, identified with the Morgan Iron Works, New York, was chosen secretary and treasurer.



MR. JOHN B. ROACH.

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The new twin-screw tow boat Greenville, building for the Pennsylvania railroad at the yard of the Maryland Steel Co., Sparrow's Point, Md., will be launched some time during the present month. The tug is 111 ft. over all, 100 ft. on the water line, 24 ft. beam and 12 ft. deep. Two triple-expansion engines with cylinders 12, 18 and 30 in. diameter by stroke of 22 in. will be installed. Steam will be supplied from one boiler, 13 ft. 8 in. long and 14½ ft. diameter, allowed 175 lbs. working pressure.

## AROUND THE GREAT LAKES.

Capt. Robt. McLeod of the car ferry Grand Haven has resigned.

The schooner Moravia, which was carried upon the beach by the flood at Toledo, was released last week.

Mrs. Lizzie Madden of Bay City has sold a one-quarter interest in the steam barge Jas. P. Donaldson on private terms.

Only three more cargoes of grain are left in Buffalo harbor to be unloaded. These are the R. E. Schuck, Venus and Uranus.

Alterations are now being made on the machinery of the Eastland at Port Huron which are intended to materially increase the speed of the boat.

The Jenks Ship Building Co. are very busy with repair work, they are making repairs on the Harlem, Eastland, Bueil, Wyoming, Boscoble and Protector.

The tug Watson owned by Capt. Robert Thomson sank at her dock at Port Huron last week without warning. It is thought the vessel opened a seam by striking heavy ice.

The steamer J. B. Eads which was in the jam at the Superior St. viaduct, Cleveland, last January, has now been placed on dry dock. It is found that her shoe and rudder are twisted.

The schooner Parana, which has been in active service since 1862, but which has now passed the days of her usefulness, will be towed out into Lake Michigan off Chicago as soon as the weather opens, and sunk.

The Michigan Steamship Co., operating a passenger line between Chicago and South Haven, has chartered the steamer Soo City for use during the coming season. She will be used on the night run out of South Haven.

The steamer Wyandotte, which has been on the Detroit sugar island route for a great many years, sank in the river at Detroit last week. Luckily she was in shallow water at the time and her main deck is not wholly submerged.

Mr. Lucius C. Fisher of Chicago has purchased the steam yacht Buccaneer, owned by Gilbert E. Orcott of New York. She is constructed of steel and is elaborately fitted out. The yacht was built in 1888 and is 123 ft. long, 12 ft. beam and 12 ft. deep.

Thomas Bradwell of Chicago, Ill., has fitted up the schooner J. B. Wilbor as a floating machine shop, fully equipped with machinists, lathes, drills, forges and hoists. The object is to tow the schooner or floating ship to any port or to any place where work may be obtained.

Mr. Frank C. Jones of San Francisco, grand president of the Marine Engineers Beneficial Association, who is making a visit to all the lodges at lake ports, was in Cleveland last week. He met a considerable number of the members of the association at the lodge rooms before leaving the city.

Lieut. Col. Davis, who has been transferred from the Phillipines to succeed Maj. Bixby as engineer at Detroit, will arrive at San Francisco March 12 on the steamer Siberia. Col. Davis will not take the customary vacation allowed to officers coming from the tropics, but will proceed directly to Detroit.

An unusually large number of mates have appeared at the office of the steamboat inspector at Chicago securing licenses with a view of promotion. The schools for nautical training conducted by Lieut. W. J. Wilson of the hydrographic service at Chicago have had a full enrollment of ambitious young men during the winter.

Gen. Mgr. T. F. Newman of the Cleveland & Buffalo Transit Line will give a series of receptions at Detroit, Cleveland and Buffalo on board the steamer City of Buffalo at the opening of navigation. This steamer has been lengthened 42 ft. and will, of course, present to the patrons of the line a far different aspect than formerly.

Bennett & Schnorbach, Muskegon, Mich., were the only bidders for moving the cribs at the southerly ends of the breakwaters at Racine and Kenosha, Wis. The bids were opened March 11th at the government engineer's office at Milwaukee. Their bid for moving two cribs from Racine harbor was $13,600 and for Kenosha harbor $14,100.

The Masters' & Pilots' Association is endeavoring to secure a pension of $5,000 for James Canniff, who has been keeper on one of the Lime Kiln crossing lightships. While working on one of the lighthouse tenders in Maumee Bay, Canniff caught in the chains of a buoy sinker and one of his legs was completely torn off. A bill has been presented to Congress for his relief.

Mr. Eugene Houghton has been appointed agent for the Pittsburg Steamship Co. at Duluth. Mr. Houghton was dispatcher for the company at Duluth last year, and looked after the loading of vessels at the head of Lake Superior. He is a son of Capt. E. P. Houghton who was master of the steamer D. M. Clemson of the Provident Steamship Co.'s fleet last season.

The Jenks Ship Building Co. is placing new engine and boiler in the Reed Machinery Co. tug Protector. The size of the engine is 16½ and 26½ and 48 by 28 in. stroke, fitted with Phoenix metal boiler, allowed 180 lbs. steam. Her upper works will be taken off and she will be made over into a sea- going tug, as Capt. Reed intends to go to the coast during the winters.

The ice barrier in Lake Michigan is the worst that lake has ever experienced. There appears to be little hope for the immediate release of the fleet of schooners which lies fastened in the ice of Milwaukee harbor. After two days of work the tugs Welcome and Meyer succeeded in releasing car ferry Pere Marquette No. 17, but the other four steamers, car ferries Pere Marquette No. 16 and 20, the Grand Haven and Crosby liner Naomi, are still fastened in the ice. Such a condition as this has never obtained before.

Mr. Frank P. Coyle, who has the contract with the freight handlers of the port of Erie, is having trouble with the local union. The union men will not sign the scale over which they had previously made no objection, and he will hire non-union men and proceed with the work. A force of non-union men are at present getting ready a consignment of sugar for shipment. The reason given by Secretary Sullivan of the local union for refusal of the freight handlers to work with Mr. Coyle was that he was antagonistic to union principles.

The steamer American Eagle, assisted by the tug Alpha, succeeded in battering through the ice gorge at Toledo last week and made her way to Craig's ship yard. The schooner Chippewa which had swung around over some piles on which it was feared she would settle as the river receded, was pulled to a place of safety in the dock. The steamer Iroquois was taken farther up the river out of harm's way, and the ice was broken at the ship yard so that the Craigs could proceed with the launching of the new passenger steamer built for lake Michigan trade.

President Edward Smith and General Manager Sinclair of the Great Lakes Towing Co. have made certain transfers in local managers. Capt. Thomas Johnson, who succeeded James Sinclair as local manager at Chicago, has been made district manager, and will have charge of all the ports where the company operates between Chicago and Duluth. John Johnson, formerly of the Hand & Johnson Tug Line of Buffalo has been appointed local manager at Chicago. Capt. H. J. Inman has resigned as local manager at Duluth and H. R. Vroman, who held the same position at Buffalo, will take his place. Mr. Louis Lautenschlager succeeds Mr. Vromen as local manager at Buffalo.

It is reported that work upon the East Chicago Co. ship canal to connect Indiana Harbor and the East Chicago will be started for the season shortly. The Chicago & Great Lakes Dredge & Dock Co. will place two immense hydraulic dredges upon the work. It is the plan of the contractors to build wharves along the side of the canal as fast as the dredges cut

their way through Lake Michigan toward the Calumet river, 4 miles away. This will enable ships to dock along the canal as fast as the waterway proceeds. The affairs of the Indiana Harbor Development Co. will this year be directed by Honore Palmer, who succeeds Albert de W. Erskine as head of the corporation building the waterway.

The Union Transit Co. of Buffalo, one of the best known package freight lines, operating between Duluth and Lake Erie, will go out of existence on April 1. The company owns the steamers Eber Ward and the John M. Nicol, and has operated the steamers New York and Rochester under season charters. The last named vessels are owned by the Union Steamboat Co., which is the property of the Erie railroad. It is not as yet known what disposition will be made of the Eber Ward and the J. M. Nicol. The Union Co. was organized in 1890 for the late John Gordon, then manager of the Northern Steamship Co., and H. C. French, both of Buffalo. Mr. Gordon subsequently sold out to Mr. French, who has been sole owner since. Its fleet originally consisted of the steamers Adam, Portage, Eber Ward, W. H. Stevens, James Fisk, Jr., and J. B. Moran. The Moran, Fisk and Adam were later sold, the Stevens sunk, and the Portage was wrecked. This reduced the Union Transit line to two steamers.

## ITEMS OF GENERAL INTEREST.

Rear Admiral P. M. Rixey of the navy is going to Panama to make a sanitary inspection of the Isthmus.

The Vancouver Dry Dock Co. is asking the city council to subscribe for $100,000 of stock in the company at par payable in city debentures.

The steam schooner Shasta, built by George H. Hitchings at Hoquiam, Wash., was given her trial trip recently, and developed a speed of 11 knots. The machinery was furnished by the Fulton Iron Works, San Francisco, Cal.

Vessels classed and rated by the American Bureau of Shipping in the Record of American and Foreign Shipping: American screw Mongolia, American screw Conestoga, American screw Umatilla, American schooner Winfield S. Schuster, American three-masted schooner George D. Edmunds and American barge Beattie.

The Neafie & Levy Ship & Engine Building Co., Philadelphia, launched two new army tugs last week. They were named Gen. Henry Knox and Col. J. Armistead, respectively. Both tugs are duplicates and are 149½ ft. long, 30 ft. beam and 13 ft. 9 in. deep. The engines will be 16 and 32 by 22, and the boilers 11 by 11½ ft.

The Independent Line, of Jacksonville, Fla., report that their steamer Manatee has been entirely rebuilt since burning last August. Altogether the improvements upon her amounted to $15,000 and the company thinks that she is a much better boat than ever. She operates from Tampa to Manatee river points. The steamer May Garner, running between Jacksonville and Green Cold Springs, has been put in thorough repair.

B. H. Warren, who was second vice president of the Westinghouse Electric & Manufacturing Co. for a number of years, has been elected president of the Allis-Chalmers Co. to succeed Charles Allis, who resigned recently on account of the ill-health of his wife. Mr. Warren is a graduate of the United States Naval Academy in the class of 1875, and saw active service in the navy until 1878. Since then he has been actively engaged as a mechanic under electrical engineering.

The Regulator Line operating from Portland, Ore., reports that the large excursion steamer Bailey Gatzert is being thoroughly renovated and will be refurnished throughout. She will also receive new deck beams and guards. The steamer Dallas City is being thoroughly overhauled and will go into service within six weeks with a new hull. The small and swift steamer Sadie B. will go into commission April 15, and will receive a new Hopkins boiler, allowed 200 lbs. pressure. This boiler will be constructed in the shops of the Williamette Boiler Works, Portland, Ore., from designs by the Iowa Iron Works, Dubuque, Iowa. The engine for the Sadie B. will be a fore-and-aft compound, 10 and 18 by 12. It is especially significant that all these vessels will be equipped to burn crude oil as fuel. The company is the pioneer on the Columbia river in introducing oil as fuel, having installed it on the steamer Regulator last July, and after six months' service is satisfied that it is the only fuel for boats. The oil is brought into the Columbia river from California by large tank steamers belonging to the Union Oil Co. of San Francisco. The Regulator Line has been operating steamers on the Columbia river between Portland and The Dalles, Ore., for the past twelve years. It is a very popular route for tourists in the summer and the scenery along the Columbia river is considered to be one of the finest in the world.

## COMMENT ON FITTING-OUT NUMBER.

"We are very much pleased with the last issue of the Review. We have long regarded the Review as one of the best possible trade papers, but in its last issue it has made a new record."

Buffalo, March 14. BROWN & Co.

"I have looked over with much pleasure the last copy of the Marine Review and find it a very much improved issue over the former ones. You are to be congratulated on the changes which I am sure cannot but meet the approval of everyone."

Very truly yours,

H. G. DALTON,
Pickands, Mather & Co.

"We wish to congratulate you upon the very handsome appearance of your issue of March 10, and, most important of all, upon the valuable reading matter contained therein."

ANTONIO C. PESSANO,
President Great Lakes Engineering Works.

Detroit, March 15.

"The current issue of the Marine Review is a delight. Its make-up and matter is of the first rank, and I am sure the lake marine interests will take renewed pride in their representative journal."

J. H. SHEADLE,
Secretary Cleveland-Cliffs Iron Co.

"Your last number is a dandy."

GEORGE A. NEWITT,
Ishpeming, Mich., March 15. Editor Iron Age.

"The last edition of the Review was certainly fine, and I have read it with much interest."

M. E. FARR,
Detroit, March 15. Treas. Detroit Ship Building Co.

"Your last number is a fine one. Mr. Kimball has just read your article relative to the life-saving service and wishes me to express his gratification at the excellent manner in which you have treated the subject. We shall preserve the entire number for binding with other pamphlets of value."

HORACE L. PIPER,
Asst. Supt. Life Saving Service.

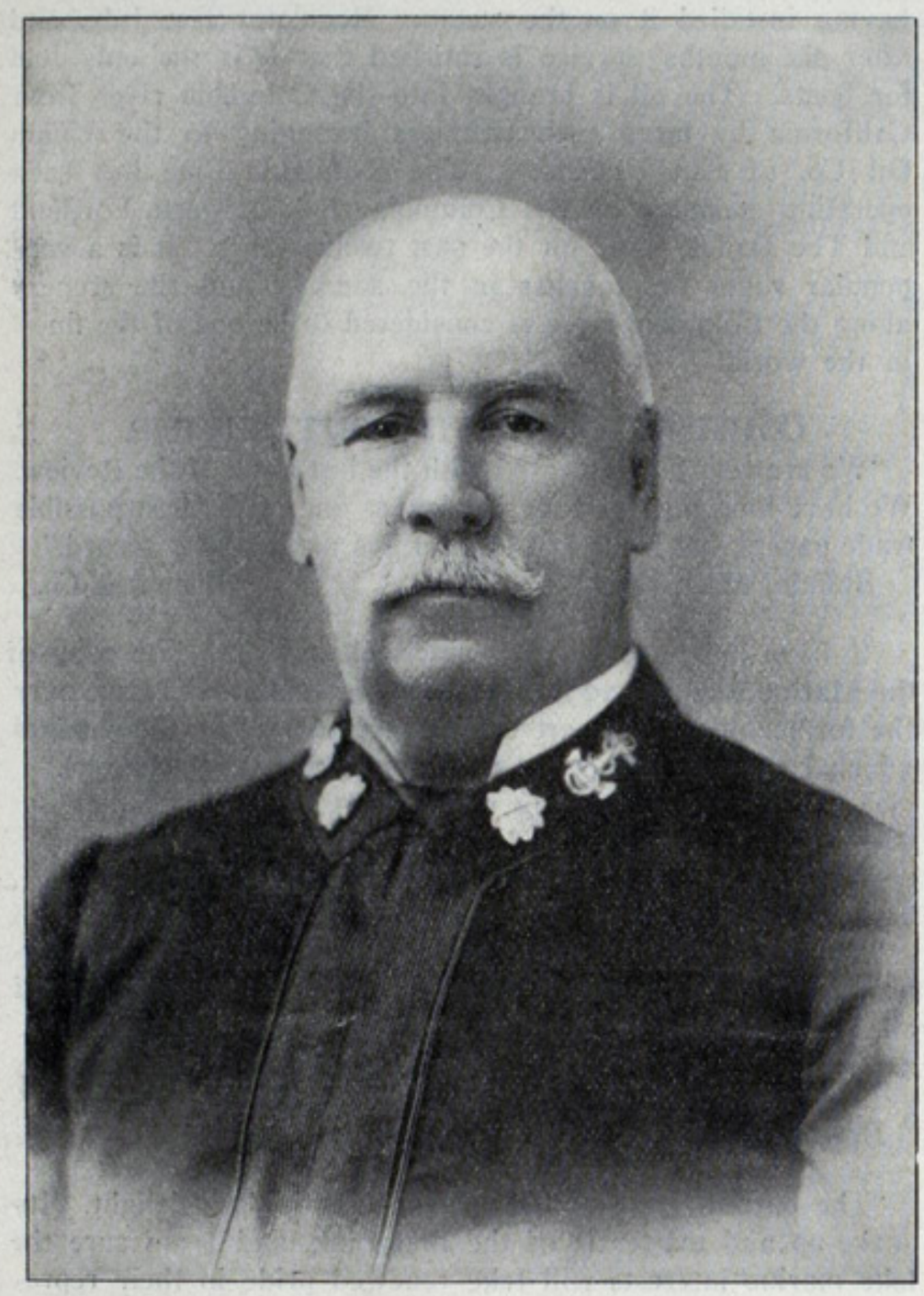
Washington, March 14.

"We have glanced through the pages of your recent issue of Marine Review and congratulate you on its attractive appearance and extent of the field the articles cover. Later on we shall give ourselves the pleasure of reading the magazine thoroughly."

JOHN J. AMORY,
President Gas Engine & Power Co. and Chas. L. Seabury & Co., Consolidated, Morris Heights, N. Y.

## RETIREMENT OF REAR-ADMIRAL O'NEIL.

Rear-Admiral Charles O'Neil, chief of the bureau of ordnance of the navy department, who retired for age on Tuesday of this week, is known all over the world as an ordnance expert, yet he never had a day's training at a technical school. He was born at Manchester, England, on March 15, 1842, and



REAR-ADMIRAL CHARLES O'NEIL.

came to this country with his parents in 1847. He passed his childhood in Roxbury, Mass., and at the age of seventeen shipped from Boston in the Oliver Putnam, bound for Calcutta, as a sailor before the mast, and returned safely. On a second voyage the vessel foundered in the Indian Ocean. She was loaded with salt, and had been run into by another ship and made to leak badly. In the midst of her trouble the pumps gave out, being choked with salt. Unhappily at the same time a gale arose, accompanied by a heavy sea, and under these conditions the vessel was abandoned, with her hull half full of water, laboring heavily in the trough.

Nevertheless, all hands were saved. The crew was divided between three boats, which separated during the first night. The boat containing the captain and a part of the crew, after drifting about for several days, was picked up by a passing vessel and taken to St. Helena; another, containing the chief mate and others, reached Madagascar, after eight or nine days. The last, in which young O'Neil had embarked, was picked up on the night of the third day by the French barque Celina, and its crew landed at the French island of Bourbon or Reunion, whence the men were sent to Mauritius, and turned over to the care of the United States consul at that place. The older men soon embarked for other ports; but O'Neil remained for several months at Port Louis, the capital of the island, and during part of the time took a position as clerk to the American consul until he could get an opportunity to return home. This came in the early part of 1861, when the John Haven of Portsmouth, N. H., put in in distress, and after making some repairs sailed for New York, taking O'Neil, to whom the captain had offered a passage. As idleness was not to the young man's taste, he was given the place of third mate, though not nineteen years of age.

The John Haven reached port not long after the breaking out of the civil war, and young O'Neil lost no time in entering the navy. The early summer of 1861 found him an acting master's mate on the ship-of-war Cumberland. He participated in both attacks on Forts Hatteras and Clark at Hatteras Inlet, and afterwards in the engagement with the Confederate ironclad Merrimac off Newport News on March 8, 1862, where the Cumberland was sunk, going down with colors flying, with the loss of 120 men. He served throughout the entire war. He reached the rank of commodore in 1896.

Com'dr. O'Neil was serving in Turkish waters during the Armenian troubles in 1893, carefully protecting American interests and affording all proper aid to the missionaries. April of 1896 again found Com'dr. O'Neil on duty in Washington as superintendent of the naval gun factory, where he remained until May 31, 1897. The next day he was appointed chief of the bureau of ordnance, and on July 21, 1897, was commissioned a captain in the line of the navy. His position as chief of the bureau carried with it the relative rank of commodore, and later that of rear-admiral, by virtue of the personnel law.

Commodore O'Neil's first six months in the bureau of ordnance were devoted chiefly to its routine work, but by the beginning of 1898 it became apparent that war with Spain was within the range of possibility, and he at once took such steps as the means at his command permitted to prepare for it. The Maine was destroyed on Feb. 15, 1898, but for some months before this O'Neil had been moving quietly in the matter of laying in supplies of ammunition. On March 6 he was summoned to the White House for a conference with President McKinley and Secretary Long, and received instructions to put his bureau on a war footing, regardless of cost. Three days later Congress appropriated $50,000,000 for national defense, about $8,000,000 being allotted to the bureau of ordnance. He also received liberal appropriations on the regular bills. On the day of his instructions he telegraphed the principal manufacturers of powder and projectiles, engaging the entire output of their works until further orders; these messages were immediately followed by the letters detailing the nature and quantity of each article they were to provide.

On March 19, at the request of the secretary of war, he directed the powder manufacturers to allot one-half their output to the army, which was greatly in need of ammunition. In the meantime he had placed larger orders abroad for small-calibre guns, of which the supply in this country was very limited, and when an ultimatum was sent to the Spanish government, on April 20, 1898, the navy, so far as its ordnance and ammunition was concerned, was ready in all respects. It will be remembered that the work of the bureau during the Spanish-American war received unstinted praise throughout the navy. Admiral Sampson made but few public speeches, but in one of them he paid a high compliment to Capt. O'Neil's administration of the bureau of ordnance, saying: "It was the one branch of the navy department that was ready when the war started, and since that time he has always kept us supplied well ahead."

On Dec. 31, 1903, O'Neil was regularly promoted to the grade of rear-admiral.

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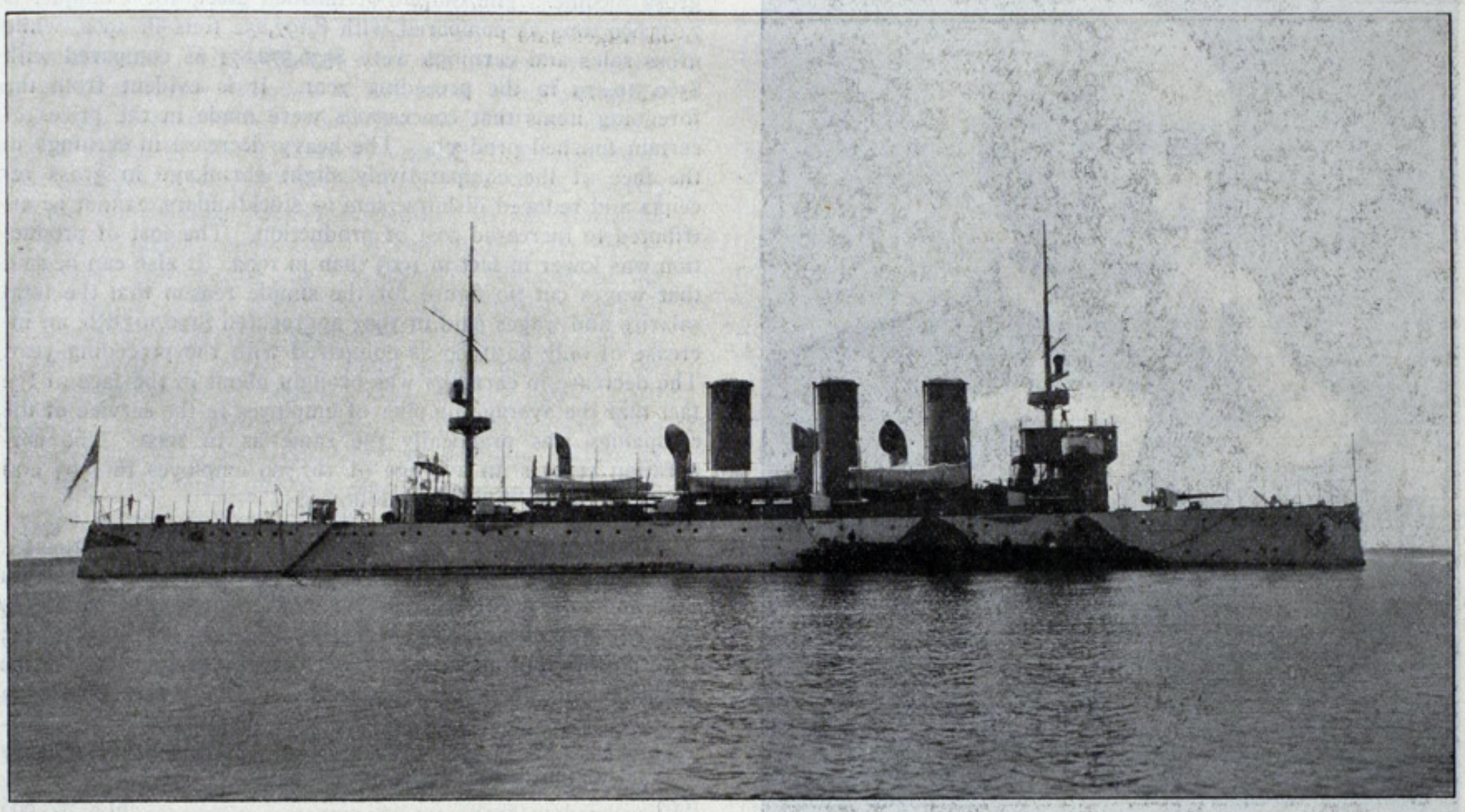
The Harpswell Steamboat Co., Portland, Me., is building a new steamer that will be added to its line about May 1. Her dimensions will be 90 ft. over all, 20 ft. beam and 7 ft. deep, and is to run on the inside route between Portland and South Freeport. This will make three steamers in all operated by this company.

## CRUISER MEDJIDIA LEAVES FOR TURKEY.

The Turkish cruiser Medjidia, which was launched at Cramp's last July, is now on her way to Turkey. She was built for the Ottoman government, and is one of several vessels which the Cramps have built for foreign navies. In 1900 Ahmed Pasha, chief engineer of the Ottoman navy, came to this country for the purpose of examining the American system of naval construction. As a result of his investigation the Turkish government contracted with the Cramp Co. for the construction of the warship Medjidia, which is of the protected cruiser type. The general dimensions and character of the vessel are as follows: Length on load water line, 330 ft.; beam extreme, 42 ft.; draught mean, 16 ft.; displacement, 3,200 tons; speed, 22 knots. The armament consists of two 6-in. rapid-fire guns, four 7-in. rapid-nre guns, six 3-pounder rapid-fire guns, six 7-pounder rapid-fire guns, one 3-in. field gun and two torepdo tubes for 14-in. Whitehead torpedoes. The battery is capable of firing 584 lbs. of projectiles at one round of all guns. Using the standard rate of firing for guns of smaller caliber, the total discharge of all guns in one minute would be 5,000 lbs. The maximum thickness of the protected deck over the space occupied by the engines and boilers is 4 in. Otherwise the vessel is unarmored with the exception of the conning tower and tube leading to the protected deck. Each of the larger guns is protected with a shield for the protection of the crew. The vessel is protected with a strong ram at the bow, strengthened by the protective deck, which forms an integral part of the ram. The engines are two in number of the inverted triple expansion type, driving twin screws. The engines are capable of developing 12,000 H. P. and the boilers are of the improved Niclausse type.



TURKISH CRUISER MEDJIDIA

*Built by Cramps, Philadelphia.* [*Photograph copyrighted by Samuel E. Rusk, Newport News, Va.*

## SECRETARY CORTELYOU'S SPEECH.

George B. Cortelyou, secretary of the department of commerce and labor, was the chief speaker at the annual banquet of the Merchants' club in Chicago last week. In discussing the subject of the merchant marine he said:

"At the close of the last fiscal year the documented merchant shipping of the United States comprised 24,425 vessels, of 6,087,345 gross tons, not including 1,828 yachts, of 74,990 gross tons. This fleet is manned by approximately 170,000 men, including masters. The American steam fleet is propelled by machinery of about 4,000,000 I. H. P., requiring an annual coal consumption of over 10,000,000 tons. Although in tonnage the United States ranks next to Great Britain, the entire growth of our shipping for the past ten years has been in the domestic trade reserved to American vessels. For years the conditions of our shipping in foreign trade has been a matter of concern to public-spirited Americans. It is virtually the only form of commercial and industrial activity in which the country has not recently shown creditable growth. As an industry it holds exceptional relations to government. From the nature of things it has been exposed in an unusual degree to foreign competition. These and other considerations make it a fitting subject for our highest statesmanship. Strong appeals in its behalf by our presidents from the time of General Grant and earnest efforts more recently in congress have so far brought meager results.

"The development of our merchant marine is one of the pressing problems. But the interests which you primarily represent are not the only ones concerned in the improvement of the merchant shipping. Recent legislation and administration have aimed to render more effective the militia of the states as an important factor in the national defense. In our past wars the men and ships of the merchant marine were the reserves that put our navy on a war footing, and under like circumstances they must perform the same service in the future. Government aid to the merchant marine in its naval features should conform closely to our general naval policy.

"Legislation has been recommended looking to the development of our commercial shipping in a manner best calculated to serve all the public interests concerned, and it is hoped that either in the shape of a commission properly constituted or in some other practicable form, the subject may have the consideration and action which its importance warrants."

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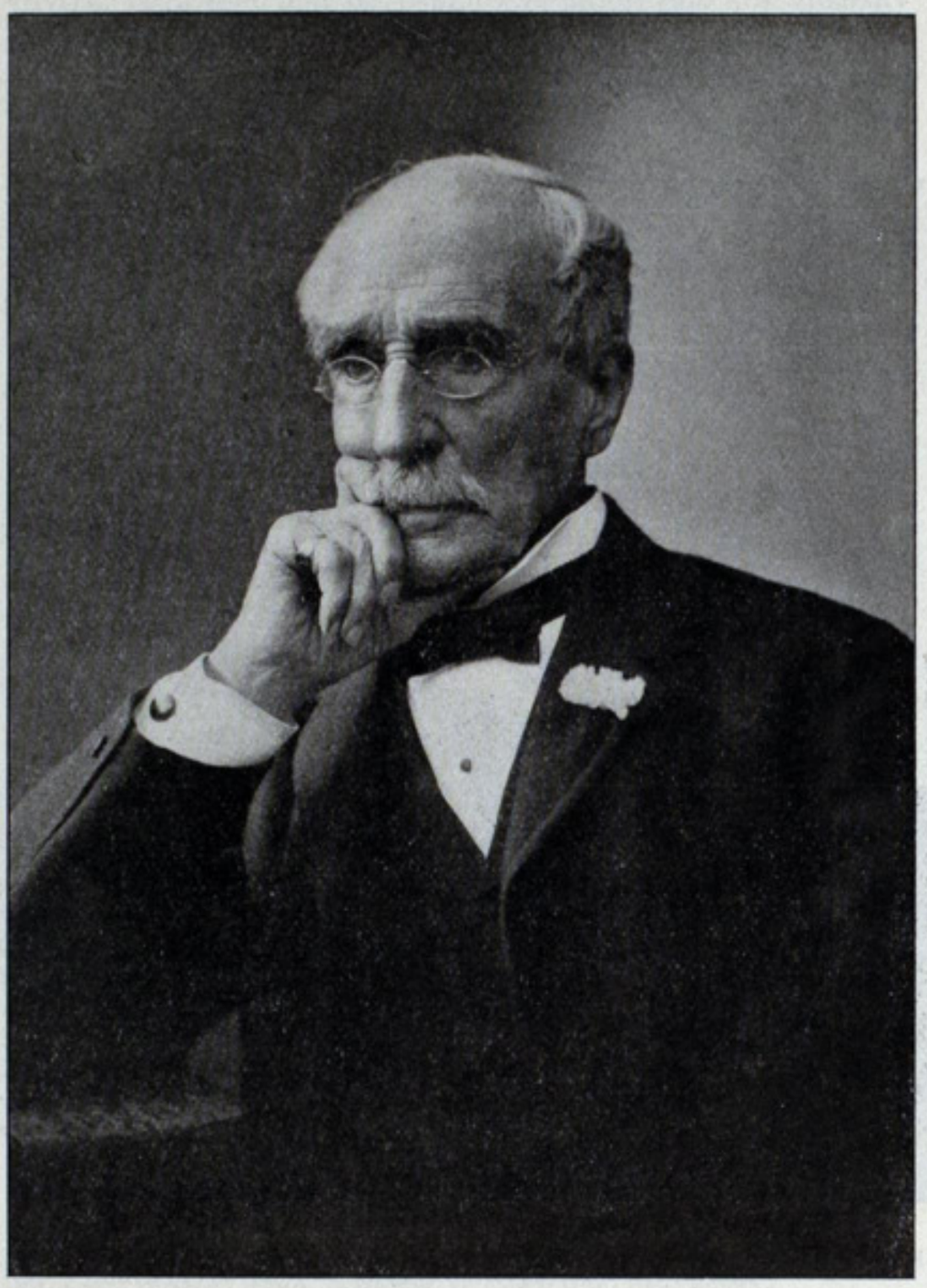
The navy department has received a cable dispatch from Guam that the cable steamer Scotia has been wrecked on Callalan bank.

## DEAN OF MARINE ENGINEERS.

Accompanying this article is a picture of Mr. Charles H. Haswell, author of Haswell's Mechanics and Engineers' Pocket Book, who has just passed his ninety-sixth year, and who is the dean of the marine engineering profession of the United States. His work is standard the world over. He is as active as a man thirty years younger. He was born in New York city and received a classical education. In 1828 he entered



MR. CHARLES H. HASWELL.

the steam engine establishment of James P. Allaire in New York city. In 1835 he was appointed by the secretary of the navy to design the engines and boilers for the steam frigate then on the stocks at the navy yard, New York. In 1836 he was appointed an engineer in the navy. In 1837 he designed and directed the construction of a steam launch, the very first ever assayed in any country. In 1843 he was appointed engineer of the navy and in consequence of ill-health left the service in 1851. During his service in the navy he was a member of the boards that designed six steam frigates and individually for it and the revenue service five others. He was consulting engineer of the old Collins Line of steamers and designed and directed the construction of six steamers in commercial service. He designed and directed the bulkhead at Hart's island, the foundations of several of the large buildings in the city of New York, tested water pump plants for cities and later designed and directed the improvements on Riker's island. He is at present assistant engineer to the board of estimate and apportionment of New York city. In 1840 his family physician told him he had no constitution, but it has not prevented him from working continuously ever since. He has however always been a careful guardian of his health. Charles H. Haswell is honored throughout the whole marine engineering world.

## ANNUAL REPORT OF STEEL CORPORATION.

The annual report of the United States Steel Corporation, the largest combination in point of capital in the world, was made public after the close of the stock exchange on Saturday last. It is a remarkable document. The stockholders of the organization are presented with an array of figures of a stupendous size. The great industrial combination is liberal in the extreme so far as facts and figures are concerned, and its fair policy in this respect has won for it favorable comment from conservative financiers and business men. As indicated by the figures the earnings for 1903 show a heavy falling off as compared with the preceding year, reaching $23,167,611. The decrease does not compare favorably with production and gross income. The output of finished steel, for example, is 7,635,690 tons as compared with 8,197,232 tons in 1902, while gross sales and earnings were $536,572,871 as compared with $560,510,479 in the preceding year. It is evident from the foregoing items that concessions were made in the prices of certain finished products. The heavy decrease in earnings in the face of the comparatively slight shrinkage in gross receipts and reduced disbursement to stockholders, cannot be attributed to increased cost of production. The cost of production was lower in fact in 1903 than in 1902. It also can be said that wages cut no figure for the simple reason that the total salaries and wages paid in 1903 aggregated $120,763,896, an increase of only $250,000 as compared with the preceding year. The decrease in earnings was brought about in the face of the fact that the average number of employes in the service of the companies was practically the same as in 1902. The corporation reports an average of 167,709 employes in 1903 and 168,127 in 1902, divided as follows:

| Employes of | 1903. Number. | 1902. Number. |
|---|---|---|
| Manufacturing properties | 123,397 | 125,326 |
| Coal and coke properties | 17,873 | 16,519 |
| Iron ore mining properties | 13,768 | 13,465 |
| Transportation properties | 11,033 | 11,160 |
| Miscellaneous properties | 1,638 | 1,657 |
| Total | 167,709 | 168,127 |

Total annual salaries and wages paid:

| | |
|---|---|
| 1903 | $120,763,896 |
| 1902 | 120,528,343 |

Judging from the depression which has existed in the iron and steel industry for the last few months the report of the Steel Corporation in the current year will present a striking contrast with that of 1903. Wages have been reduced, thousands of employes have been laid off, prices of certain products have been cut and profits have been reduced on steel for export, a branch of the steel business that the Steel Corporation began to develop when it realized that domestic consumption was on the decline. It is interesting to note that in spite of the closing up of the mills, a movement which began in August of last year, about the same number of men were employed in 1903 as in 1902. It required about the same number of men to produce 763,690 tons of finished steel in 1903 as it did to produce 8,197,232 tons of steel in 1902. This is a feature of the report which is not explained.

The "balance of surplus" reported by the corporation each quarter since its creation is rather confusing. That item at the close of the quarter ended June 30, 1901, is given as $30,950,249. From this figure the surplus shows a gradual increase until Sept. 30, 1903, when $99,809,836 was reached. Three months later the "balance of surplus" was $66,096,682, a decrease of nearly $34,000,000. On Dec. 31, 1902, a total surplus of $77,874,597 was reported.

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Capt. Crawford has been engaged to take charge of the turbine steamer for the Toronto-Hamilton run, and has gone to England to see to the finishing of the steamer and to bring her out.

## LIVERPOOL SHIPPING LETTER.

Liverpool, March 5.—Lord Lansdowne, the British foreign minister has this week received a deputation representing the law, shipping and commercial institutions of London, Liverpool, Glasgow and North East Coast on the subject of uniformity in maritime law in relation to collisions at sea and salvage. It may be explained that the deputation was undertaken for the purpose of asking the Government to take part in a suggested diplomatic conference of the Maritime Powers of the world which will discuss the best means to be adopted for securing uniform law in regard to these two important subjects, and that the United States, France, Russia, Austria-Hungary, Italy, Norway, Sweden and Japan have already notified their willingness to take part in the conference. So far all the preliminaries leading to the suggestion of a conference of the powers has gone along quite smoothly, although it has taken many years for the final agreements to be made. The views of the deputation were voiced by Mr. Charles M'Arthur, M. P., representing the Liverpool Chamber of Commerce; Mr. T. G. Carver, K. C., the International Law Association; Mr. E. Harrison, K. C., for the general council of the English bar; Mr. W. F. G. Anderson, representing the Chamber of Shipping of the United Kingdom; Sir John Glover, on behalf of British ship owners, and Mr. De Rougemont, chairman of Lloyds, which all tended to show the many disadvantages in the present divergencies of collision and salvage law. Lord Lansdowne replying said "he was in entire agreement with the deputation as to the desirability of obtaining uniformity of the law. The only question was as to the best means. Up to the present time the British government had refused to take part in conferences for discussing these matters, but its reluctance was due entirely to the fact that the government recognized the enormous interests of Great Britain in the shipping of the world, and did not like to take any steps to bind British ship owners. They were in this respect a large state, and yet at this conference they would only count the same as a smaller state, whose interest in shipping was far less than their own. He understood, however, that the ground had been fully prepared by previous discussions, and that therefore the matter was ripe for an official convention. The draft codes that had been prepared by the Comite Maritime International at Antwerp he would fully examine, and his decision on the matter would afterwards be made known to the deputation." It is generally believed that the British shipping interest being just as anxious as any other for uniformity, will influence Lord Lansdowne to accede to the wishes of the deputation.

The Liverpool Underwriters' Association have just issued their monthly return of casualties to vessels of 500 tons gross register and upwards which have been posted in the Loss Book during the month of February. From this it is seen that the total is 508, against 560 in the corresponding month of 1903, and 464 in February of 1902. The total losses included three British sailers of 3,847 tons, three British steamers of 10,412 tons, six foreign sailers of 5,318 tons, and eight foreign steamers of 9,940 tons. The partial losses were: British, twenty-six sail and 225 steam; foreign, forty-six sail and 191 steam, making a grand total of twenty total losses, and 488 partial losses. The nature of casualty is returned as follows: Collisions, 138; strandings, 128; weather damage, 116; damage to machinery, shafts, etc., sixty-eight; fires and explosions, twenty-four; founderings and abandonments, three; missing, two; and other casualties, twenty-nine. The figures are generally speaking lower than in the corresponding period of last year, but higher than the figures for the same month in 1902 and 1901.

Additional new works on the Mersey Dock estate were brought forward at this week's meeting of the Mersey Docks & Harbor Board, which will entail the expenditure of over $250,000. The greater part of this sum is to be spent in providing additional quay space on the west side of the Prince's Dock, which since the building of the Riverside Railway Station has been little used. It is proposed to project into this portion of the Prince's Dock, new quay space on piles, and erect thereon a shed 700 ft. long, thus providing 5,000 or 6,000 superficial yards of quay space. This dock is situated close to the Liverpool landing stage, and therefore near the center of the town, and is admirably adapted for the coasting or short voyage traders. It will become especially valuable if the engineer can carry out his intention of deepening the sill a further 2 ft.

There has been launched this week from the yard of Messrs. Swan Hunter & Wigham Richardson, Ltd, Wallsend-on-Tyne, a novel and interesting craft, described as a floating coal depôt, built to the order of the British admiralty. The depôt is 424 ft. long, 67 ft. 9 in. broad, and has storage capacity for 12,000 tons of coal. The output capacity is said to be at least 500 tons per hour, and it is maintained that fully 720 tons per hour may be transhipped, if the despatch runs without a hitch. The depôt is so fitted as to insure the rapid coaling of war vessels, the rapid filling of bags without shovelling and with safety to the men, accessibility, mobility, storage capacity, storage of coal under cover, the coaling of two or more vessels at the same time, the coaling direct from collier to warships, which obviates the occupation of valuable quay space, the breakage of coal in loading and delay in starting coaling. The craft is the first of its kind that has been built, and the plans have been prepared by the builders in conjunction with the Temperley Transporter Co., and of course the admiralty. There is a distinct use for such a coal ship at Portsmouth, and its career in this respect is pretty certain to be closely watched in naval circles. Messrs. Vickers, Sons, & Maxim, of Barrow, have also launched from their yard this week, two more submarine vessels of the Holland type, for the British admiralty. It is probable that six more will be put into the water by the end of the next four or six weeks. One submarine in course of construction at Barrow is of a new design, and under the supervision of Capt. Bacon. The vessel contains many improvements suggested by recent experiments, and it is expected that the ten submarines provided for by this year's estimates will be of this type.

Mr. J. Bruce Ismay, the new president of the International Mercantile Marine Co. has since his return here from the States on Thursday been besieged with representatives of the British press seeking to have outlined to them the possible changes and developments that will ensue now that he has assumed the direction of this great undertaking's affairs. But Mr. Ismay declined to be drawn, and all the information that could be got from him was that at the present time it was impossible to say anything as to the changes that might take place either in the combination of the lines or in the White Star Line. A vast amount of detail he said had to be gone into and when any definite movement was settled, he would be glad to afford information on the subject. In an interview he subsequently gave to one of the reporters, Mr. Ismay said that with regard to the location of the headquarters of the shipping combination, that would be where he happened to be,—he might be in England or America, and he intended to make periodical visits to the latter country. He further said it was not contemplated to transfer the various flags of the other lines to the White Star; the ships would remain as they were, and he would give particular attention to the White Star Line, while looking after the business as a whole. This statement disposes of many of the speculative rumors that have been in circulation here, and cabled from New York that the several companies forming the combine are to be merged into the White Star undertaking.

## SCOTTISH SHIP BUILDING LETTER.

Glasgow, March 9.—This week the reduced wages come into operation among the "black squad" in the ship yards of this district, and, contrary to the expectation a few weeks ago, the men are working as placidly as if there was nothing the matter. That is to say, those of them who can get work; but unfortunately there are a large number who can only look on at present. The "black squad" includes all workers in iron about a ship's frame and it includes not only all the membership of the Boiler Makers' and Iron Ship Builders' Society but also part of the membership of the Shipwrights' Society (which also includes the men who work at the wood work of a ship) and the Blacksmiths' Society. But the larger number of the "black squad" are members of the Boilermakers' Society, and most of them on piece-rates earn very large wages—up to, in some cases, £8 or £9 per week. To men earning such wages a reduction of 5 per cent. is not a very serious thing so it has been accepted as preferable to a fight. The smiths and shipwrights do not earn so much but they also can clear a good deal in the week and are more peacefully inclined as a class than the members of the Boiler Makers' and Iron Ship Builders' Society. So far the reduction is only on piece-rates, but it is piece-workers who do the most of the constructive work of a ship. The machinists are not concerned in this reduction. As against it, ship plates are £5 15s, angles to £5 5s less 5 and not only are firmly held at the advanced rates but are more likely than not to be advanced further, as the Scotch steel makers have now concluded a vigorous agreement under which each of them is subject to a penalty (deposited in advance) of £1,000 if he sells below the prices fixed by the combine, plus £1 per ton for every ton of stuff sold. This applies to all sales in Scotland and in the North of Ireland but not in England where each Scotch maker is at liberty to sell for what he can get. Negotiations, however, are on foot to get the English steel makers into the combine, and if the efforts are successful, pity the poor ship builder! Meanwhile, steel ought to be getting cheaper and not dearer—inasmuch as both coal and crude iron are declining and the establishment of new conciliation boards in the coal trade has removed all probability of strikes among the miners for two or three years to come. It is curious, but there is nothing of cause and effect in the fact, that ship building should have revived both in the North of England and here just as wages were reduced. The reduction in the North of England began on Jan. 6, and there has certainly been more booking there than here. The new contracts booked by Scotch ship builders in February aggregate about 50,000 tons, or just about the amount of tonnage launched during the month. It is an improvement, certainly, but after all, a mere flea bite for our capacious yards. These new contracts, such as they are, are booked among about a dozen yards and we have fifty! The new orders include the new 12,000 ton turbine Cunarder to be built by John Brown & Co. Ltd., a few coasters and tugs, a couple of submarine boats for the admiralty; and about a dozen cargo tramps of various sizes, to be built by several builders. The launches in February consisted of thirty-six vessels of about 49,500 tons, of which the Clyde furnished thirty-six vessels and 48,700 tons. The chief items were the Union-Castle Mail liner, Dover Castle, built by Barclay, Curle & Co., Ltd.; a 4,400-ton boat for the Monarch line built by Napier & Miller; the Miami, of 4,000 tons, built by Barclay Curle & Co., for Elder & Fyffes Co.; The Esterel of 2,400 tons, built A. McMillan & Sons for Marseilles owners; the Tean of 2,200 tons, built by Scott & Co., for the China Navigation Co.; the turbine steamer Princess Maud, of 1,730 tons built by Denny & Bros. for the Scotch and Irish passenger service; the Warrior steam yacht of 1,150 tons built by the Ailsa Ship Building Co. and engined by A. & J. Inglis, for Mr. F. W. Vanderbilt of New York; a four-masted sailer of 3,200 tons built by William Hamilton & Co., and a four master of 2,000 tons built by the Grangemouth & Greenock Dockyard Co., Greenock, both for German owners; and a number of smaller craft.

Yet another turbine sea-goer is the new steamer Princess Maud, launched at Dumbarton by William Denny & Bros. for the Larne & Stranraer Steamship Joint Committee, and the first turbine steamer built for the Irish cross-channel service. Her principal dimensions are: Length, 300 ft.; breadth, 40 ft.; depth, 24 ft. 6 in. to promenade deck. The first-class accommodation, situated amidships, consists of a deck saloon, ladies' cabin, smoking room and four special staterooms on the promenade deck and a dining saloon and a number of special staterooms on the main deck. The third-class accommodation aft consists of a ladies' cabin on the poop deck, a saloon on the lower deck, and a large restaurant on the main alongside of which is accommodation for cattle dealers. The remaining spaces on the main and lower decks, together with the fore hold, are fitted up for the carriage of cattle and horses. Both the bridge and poop decks are covered by boat decks extending out to the ship's side, thus providing sheltered promenades for first and third-class passengers. A novel feature in the vessel is the special stowage arranged for yeast, a perishable cargo, of which considerable quantities are carried by this route. The decorative features of the public apartments have been very carefully designed and executed. The dining saloon is framed and panelled in oak. The architectural style is renaissance in character. The ladies' retiring room on the main deck is in polished sycamore, the panels being decorated in Japanese style with apple blossom and bird design. The smoking-room is panelled throughout in dim polished oak lightly relieved with carving. The ship is lighted throughout by electric light. To facilitate handling in harbor she has rudders both aft and forward. The stern rudder, which is of the balanced type, is specially designed by the builders for their turbine steamers, and is controlled from the flying bridge by telemotor. The forward rudder is also controlled from the flying bridge. The vessel has an equipment of boats and other life-saving appliances fully up to the Board of Trade standard, all the boats being fitted with rapidly clearing chocks and patent disengaging gear. The propelling machinery consists of three sets of turbines by the Parsons Marine Steam Turbine Co., supplied with steam by boilers constructed by Denny & Co., Dumbarton.

An interesting vessel for the West Indian trade is the Miami, built for Elder & Fyffes by Barclay, Curle & Co., Glasgow. She is constructed of steel to the highest class of Lloyds and the British Corporation requirements. Her general dimensions are: Length, 363 ft.; breadth, 46 ft. 3 in.; depth, 32 ft. 6 in. This vessel has been designed expressly for the carriage of bananas from Port Limon to Manchester and has a capacity of hold sufficient to carry between 35,000 to 45,000 bunches. For the carriage of fruit the vessel is completely insulated with cow hair and silicate of cotton to ensure it being kept at a low and uniform temperature, the spaces being subdivided into bins for protecting and stowing the fruit. The vessel is lighted throughout with electric light. In a large deck house on upper deck amidships accommodation is provided for twelve passengers in six large and well-ventilated staterooms. The dining saloon is in the center of the house, and is a large compartment, well lighted by overhead skylight and side scuttles and framed in light oak.

The facilities for loading and discharging cargo are very complete, four cargo hatches of ample size being fitted with derricks and powerful steam winches. The machinery, constructed by the builders, consists of one set triple-expansion engines, 27 in., 43 in. and 72 in., with 48 in. stroke, supplied with steam from four large single-ended boilers, capable of driving the vessel 12½ knots at sea. The boilers are worked under natural draft, and are fitted with one large funnel and special ventilating arrangements.

A letter recently received by John F. Allen, 370-372 Gerard avenue, New York city, manufacturer of the Allen Portable Pneumatic Riveting Machine, from the Manitowoc Steam Boiler Works, Manitowoc, Wis., indicates the usual experience of those who have used these high class tools. It reads: "In regard to the 96-in. boiler riveter that you sold May 7, 1903, we wish to say that from the time the riveter was started at Dexter, N. Y., until the work was completed, we did not lose one minute's time on account of the machine and since we have had the riveter in the shop we have used it extensively and we have had no trouble in driving 1¼-in. rivets and having the work absolutely tight for a pressure of 100 lbs."

The Lake Superior Contract & Dredging Co. of Duluth, Minn., was the lowest bidder for dredging at Superior harbor basin and in the Superior entry, Wis. The company's bid was 12½ cents per cubic yard.

The Kelley's Island Dock & Steamboat Co., Kelley's Island, O., say that it is their intention to place a new steamer on the route between Kelley's Island and Sandusky, but whether they will build or purchase a steamer has not yet been determined. The company is desirous of having a steamer that can operate through ice.

The Farrar Transportation Co., which owns the steamer Newmount, has declared a dividend of 10 per cent. for 1903. Following are officers for 1904: President, C. A. Farrar; vice president, W. R. Rowland; secretary, G. F. Fair; manager, W. Carmichael. Offices, Collingwood, Ont.


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### Small Steamer Wanted.

Wanted to buy a small steamer, 70 to 80 ft. length, with plenty beam, that will do for excursion or ferry boat. Single deck preferred. Send full description with lowest cash price. Address L. E. Eggert, Muskegon Heights, Mich. Mar. 24

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Steamers Russell Sage and John C. Gault, with complete fit-out for package freight, electric light plant, etc. Will carry 40,000 bushels wheat, or 1,200 tons package freight on draft of 14 ft. Both vessels can be seenat Toledo, O. For further information apply to A. W. Colton, Toledo, O. Mar. 31

### Hydraulic Slings for Sale.

Hydraulic slings consisting of beam, cylinders, plungers, uprights, hydraulic and feed pumps, engine, etc, capable of raising 300 tons. Address McKinnon Mfg. Co., Bay City, Mich. tf

### Steamer for Sale at Cost—$13,500.

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### For Sale.

Tug Duncan City. Address, Geo. Pankrantz Lumber Co., Sturgeon Bay, Wis. tf

### Tug for Sale.

Tug Frank Canfield, 75 ft. long. Engine 18 x 20, boiler 6½ x 13. Address Canfield Tug Line, Manistee, Mich. Apr. 28

### Marine Fire Box Boiler for Sale.

16 ft. long, 9 ft. 6 in. diameter; allowed 125 lbs. steam; in good condition. Price reasonable. Address Capt. John Green, 402 West Ferry St., Buffalo, N.Y. tf

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Steamer Ogantz, 80 ft keel, 18 ft. 8 in. beam, 7 ft. 6 in. draught. Fore and aft compound engine, 14 and 25 by 16 in. Scotch boiler, 10 ft. by 84 in., allowed 125 lbs. steam. Passenger allowance—45 regular and 190 excursion.

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For particulars, address C. A. Nielson, Sandusky, O. Mar. 17

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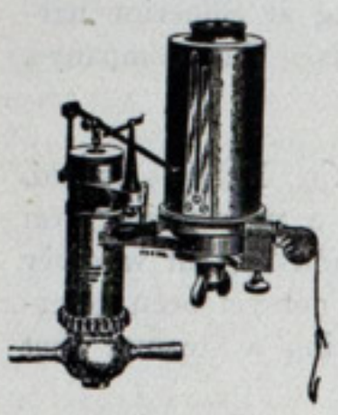
U. S. ENGINEER OFFICE, Milwaukee, Wis., Feb. 17, 1904. Sealed proposals for building an Elevator Dredge with Auxiliary Conveyor will be received here until 3 P. M March 19, 1904, aud then publicly opened. Information furnished on application. J. G. WARREN, Major, Engrs. Mar. 17

TREASURY DEPARTMENT, Washington, D. C., Feb. 27, 1904.—Sealed proposals are invited and will be received at this Department until 2 o'clock p. m., Saturday, April 16, 1904, at which time and place they will be opened in the presence of attending bidders for the construction of one steam screw propeller for the United States Revenue-Cutter Service, for duty on the coast of Maine, to be known while in course of construction or until launched as No. 14, R. C. S. Said vessel is to be constructed in accordance with the plans and specifications provided by the Secretary of the Treasury, which, together with form of proposal, contract, etc., may be obtained upon application to this Department. Bids must be addressed to the Secretary of the Treasury, and be indorsed on the envelope, "Proposal for Revenue Steamer for Coast of Maine." The right is reserved to reject any or all bids and to waive defects if deemed for the interests of the Government so to do. ROBERT B. ARMSTRONG, Acting Secretary. Mar. 17



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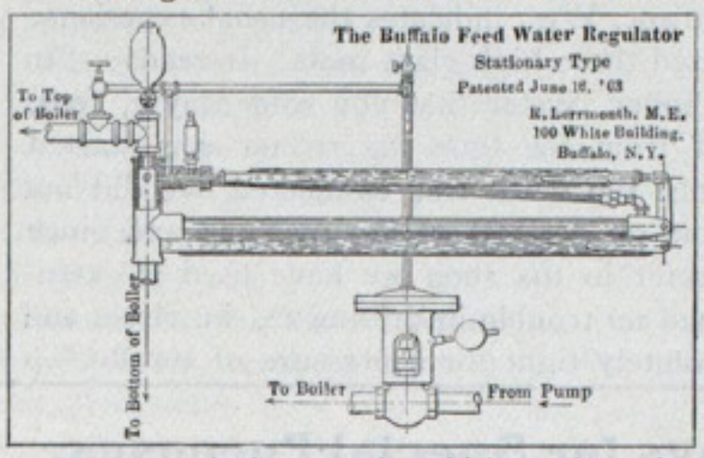


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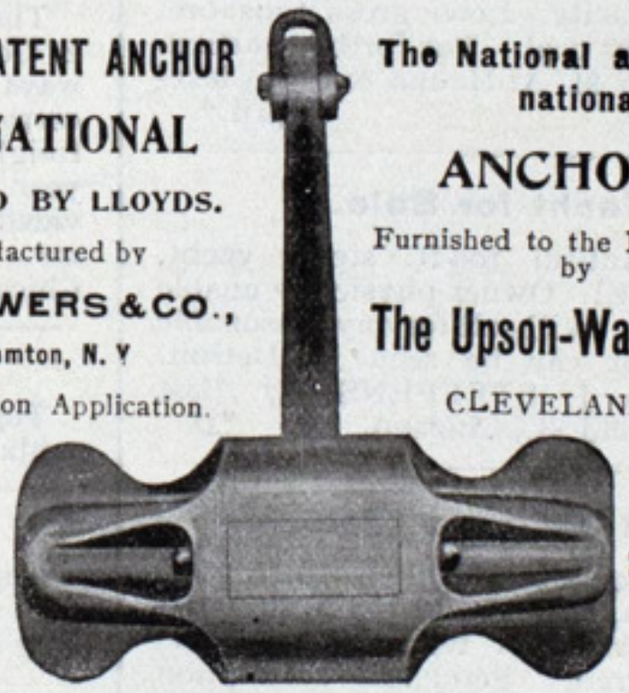

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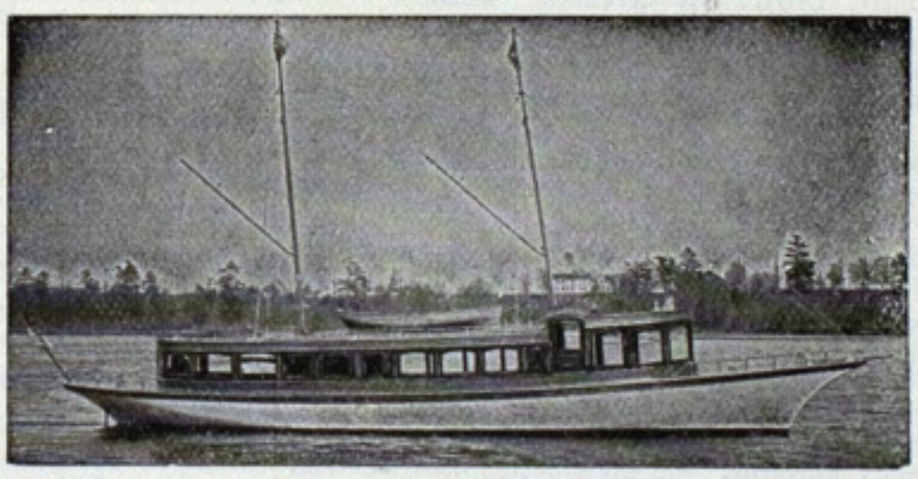

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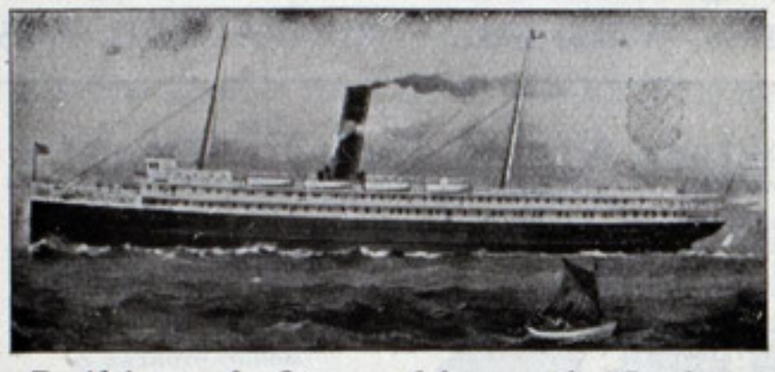

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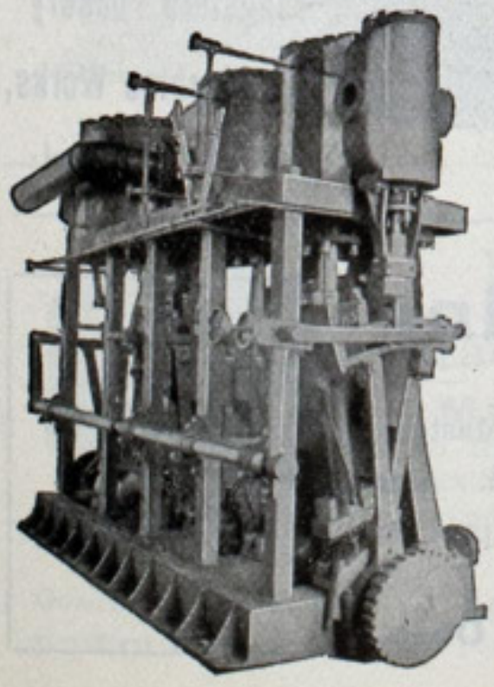

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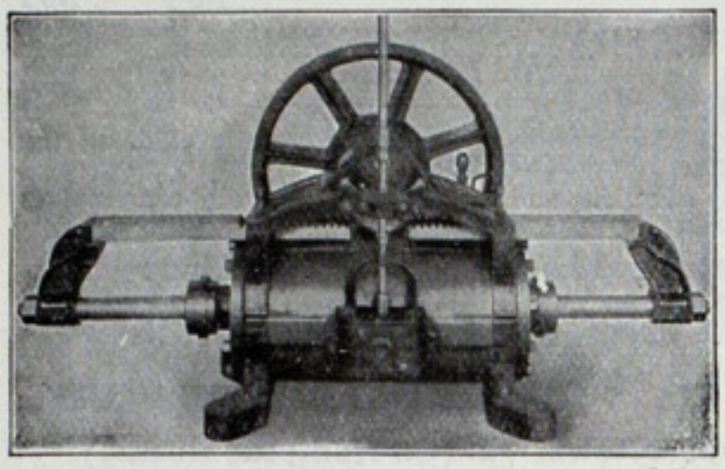

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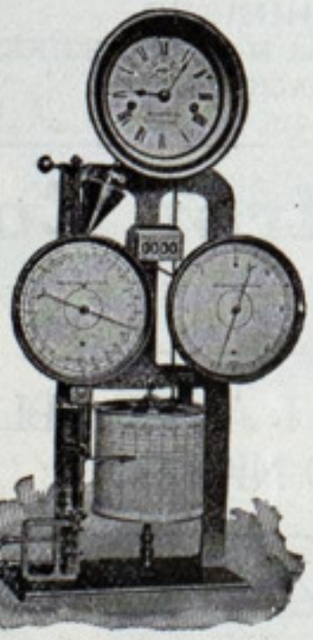

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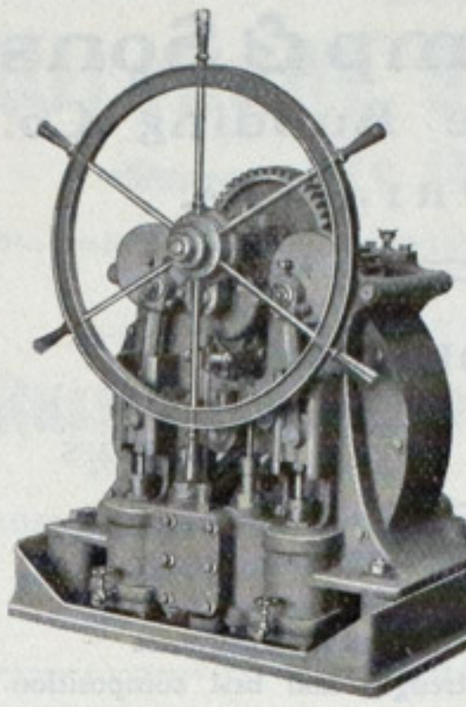

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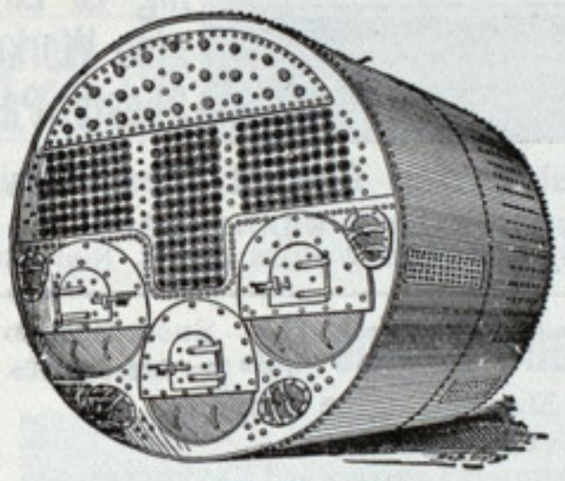

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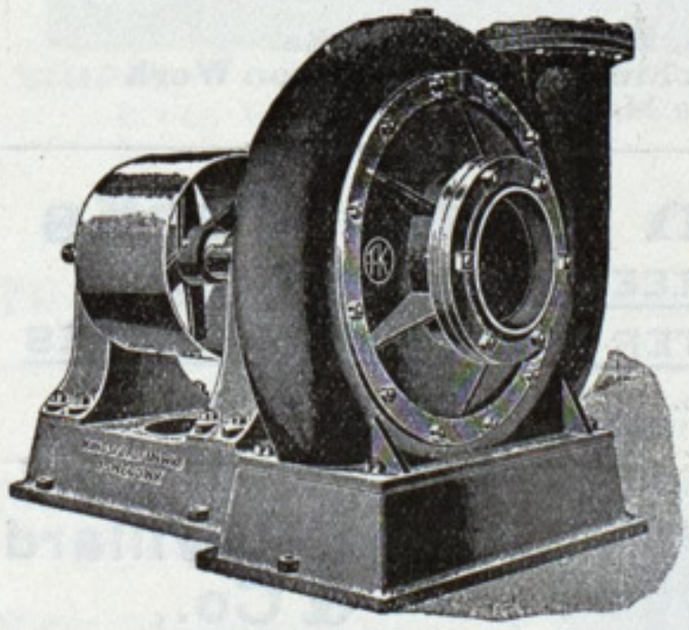

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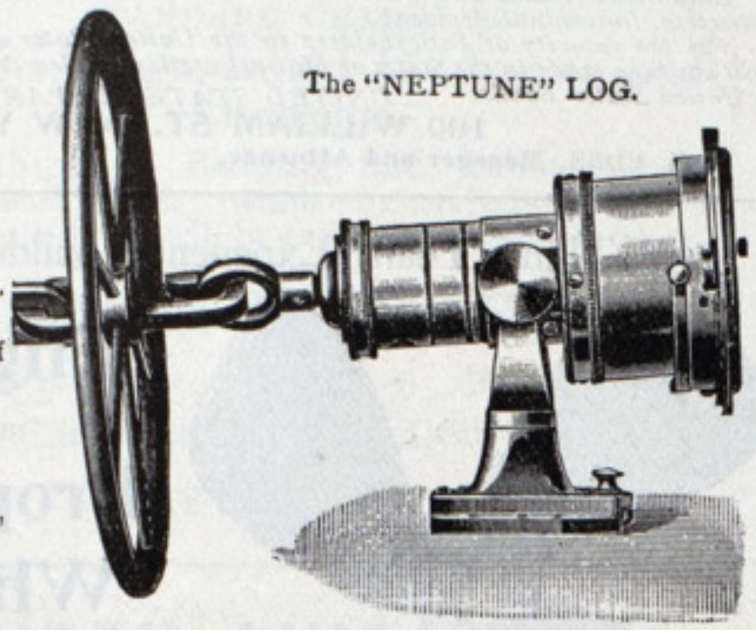

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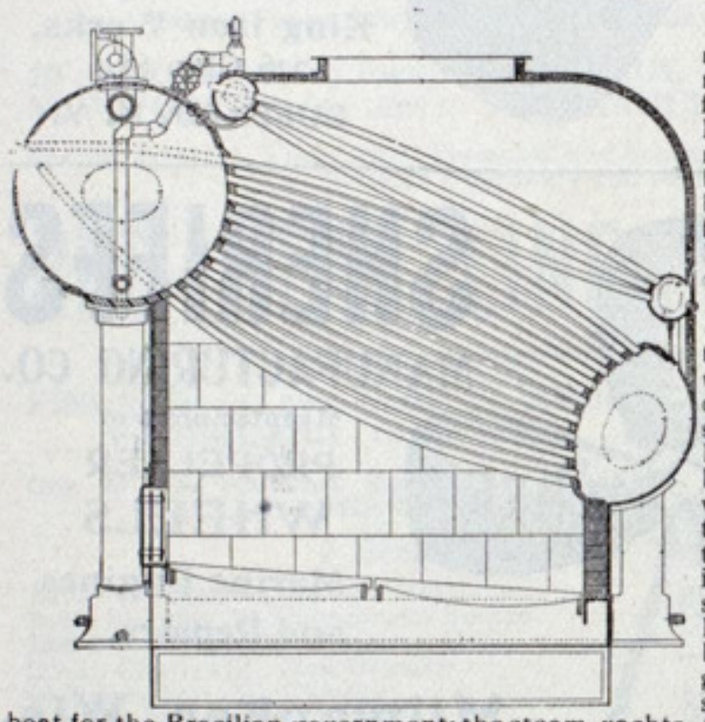

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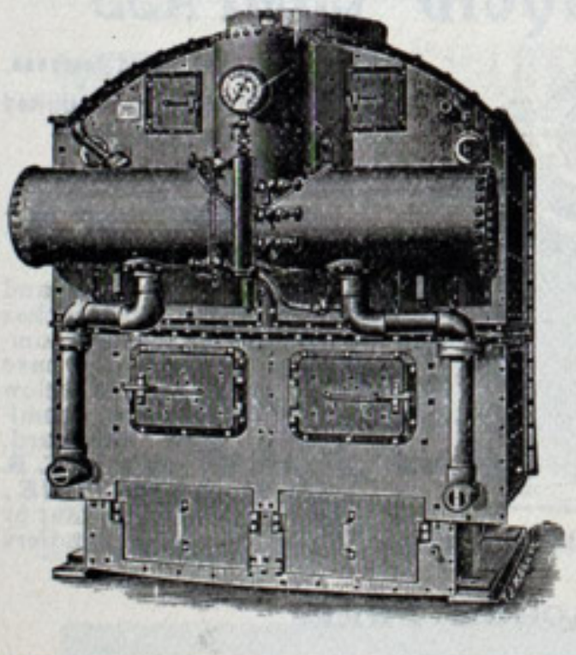

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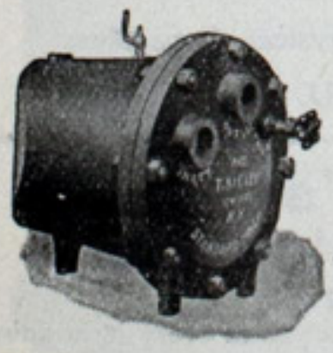

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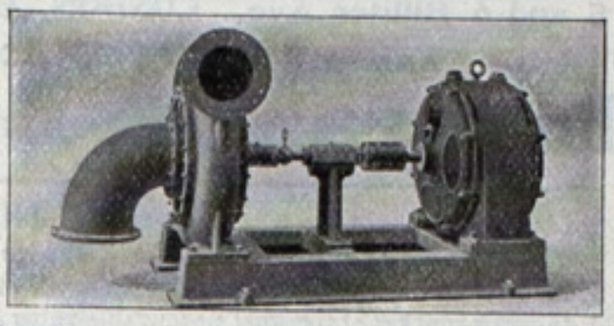

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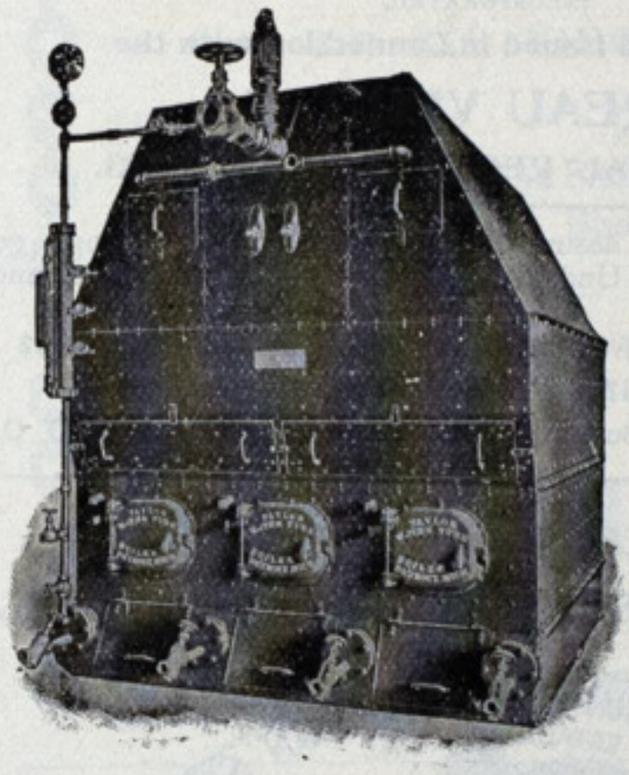

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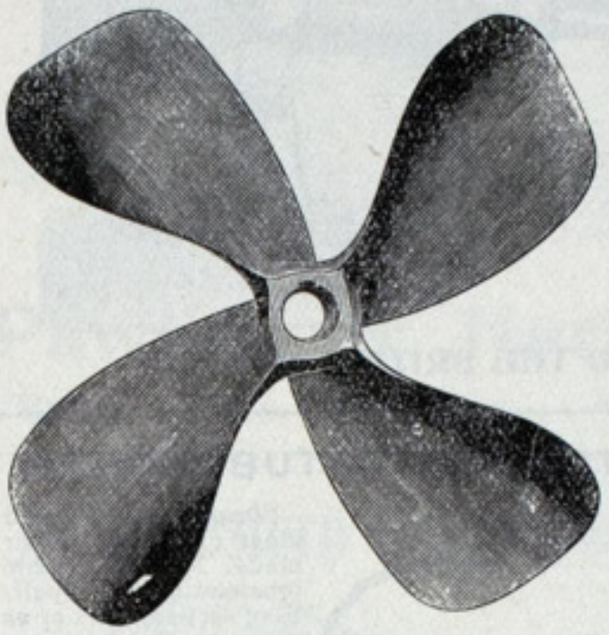

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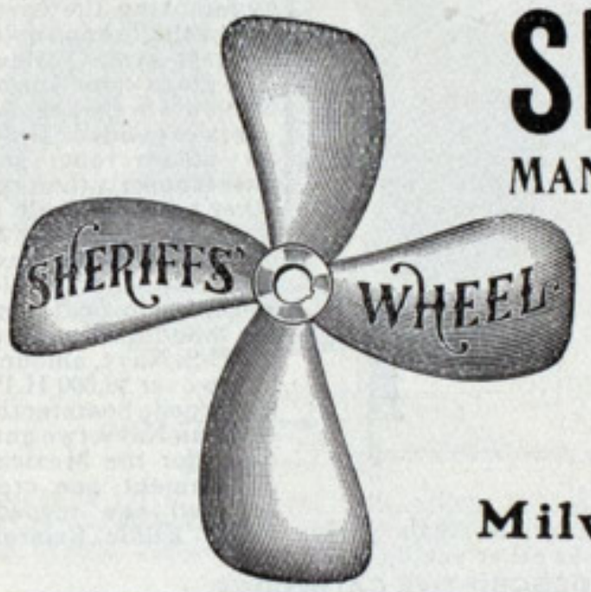


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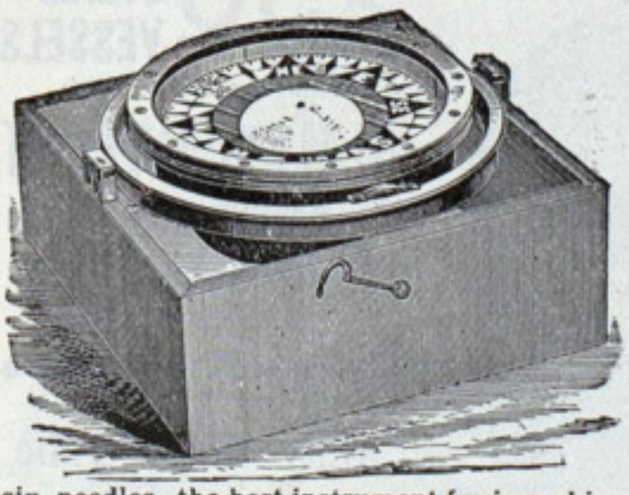

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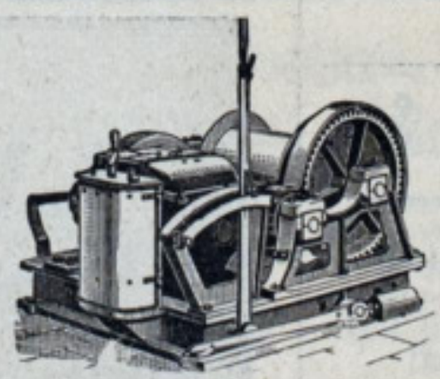

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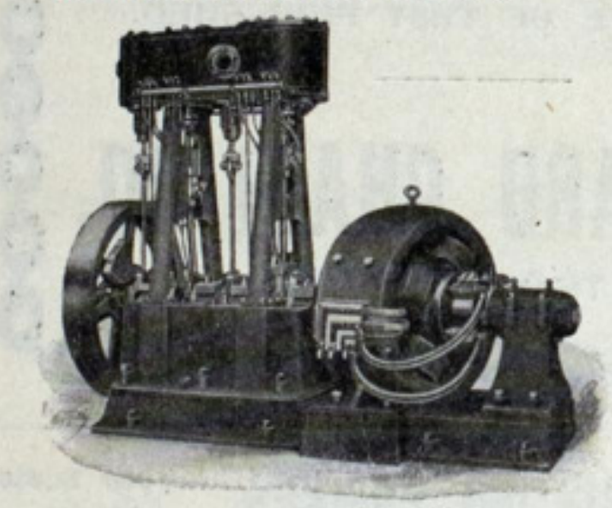

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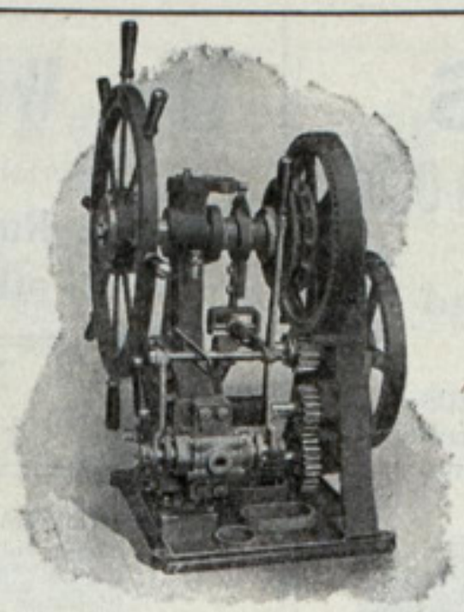

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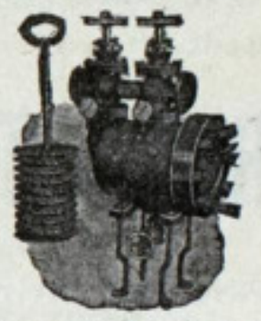

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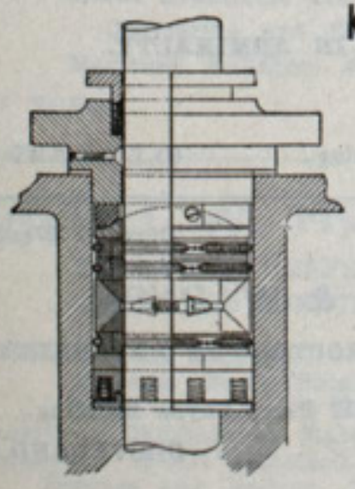

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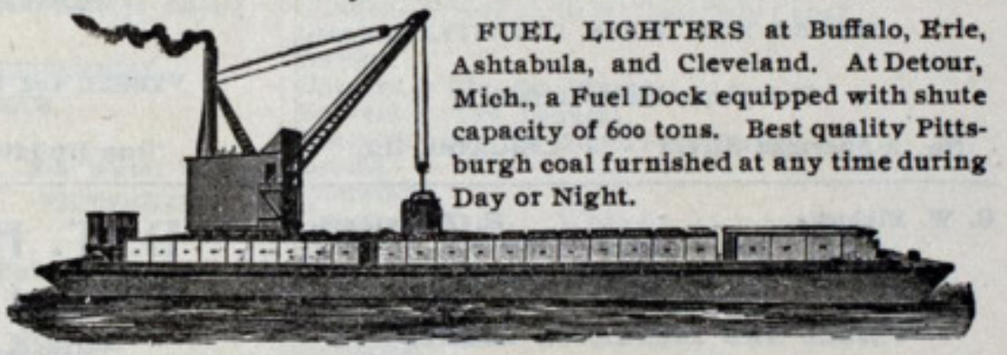

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Siegel, Cooper Co.....New York.
Williams & Rodgers Co.....Cleveland.

### CEMENT, IRON FOR REPAIRING LEAKS.

Smooth-On Mfg. Co.....Jersey City, N. J.

### CHAINS.

Lebanon Chain Works.....Lebanon, Pa.
Standard Chain Co.....Pittsburg.

### CHAIN HOISTS.

Boston & Lockport Block Co.....Boston, Mass.
Dake Engine Co.....Grand Haven, Mich.

### CHARTS.

Marine Review Pub. Co.....Cleveland.
Potter, J. D.....London.

### CLOCKS (Marine and Ship's Bell) AND CHRONOMETERS.

Ashton Valve Co.....Boston.
Bliss, John & Co.....New York.
Chelsea Clock Co.....Boston.
Ritchie, E. S. & Sons.....Brookline, Mass.

### COAL PRODUCERS AND SHIPPERS.

Hanna, M. A. & Co.....Cleveland
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Rochester & Pittsburg Coal & Iron Co.....Buffalo.

### COAL AND ORE HANDLING MACHINERY.

Brown Hoisting Machinery Co (Inc.)....Cleveland.
Lidgerwood Mfg. Co.....New York.
Macbeth Iron Co.....Cleveland

### COMPASSES.

Bliss, John & Co.....New York.
Ritchie, E. S. & Sons.....Brookline, Mass.

### COMPASS ADJUSTER.

Smith, Capt. W. J.....Seattle, Wash.

### CONCRETE MIXERS.

Contractors Supply & Equipment Co.....Chicago

### CONDENSERS.

Thropp & Sons Co., John E.....Trenton, N. J.

### CONTRACTORS SUPPLIES.

Contractors Supply & Equipment Co.....Chicago.

### CONTRACTORS FOR PUBLIC WORKS.

Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co....Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H.....Milwaukee.

### CORDAGE.

Baker & Co., H. H.....Buffalo.
DeGrauw, Aymar & Co.....New York.
Upson-Walton Co.....Cleveland.

### CORK JACKETS AND RINGS.

Armstrong Cork Co.....Pittsburg, Pa.
Kahnweiler's Sons, D.....New York.
Lane & DeGroot.....Long Island City, N. Y.

### CHAIN CONVEYORS, HOISTS.

Bartlett & Snow Co., C. O.....Cleveland.
Brown Hoisting Machinery Co (Inc.).....Cleveland.
General Electric Co.....Schenectady, N. Y.
Lidgerwood Mfg. Co.....New York.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

### CRANES, TRAVELING.

Bartlett & Snow Co., C. O.....Cleveland.
Brown Hoisting Machinery Co.....Cleveland.
Lidgerwood Mfg. Co.....New York.
Pawling & Harnischfeger.....Milwaukee.

### DISTANCE FINDER.

Nicholson Ship Log Co.....Cleveland.

### DIVING APPARATUS.

Morse, A. J. & Son.....Boston.
Schrader's Son, A.....New York.

### DREDGING CONTRACTORS.

Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co....Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H.....Milwaukee.

### DRYING APPARATUS.

Sturtevant, B. F. Co.....Boston.

### DRY DOCKS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Buffalo Dry Dock Co.....Buffalo.
Chicago Ship Building Co.....Chicago.
Craig Ship Building Co.....Toledo, O.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.Newport News, Va.
Shipowners Dry Dock Co.....Chicago.
Superior Ship Building Co.....Superior, Wis.
United States Ship Building Co.....New York.

# BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

### ELECTRIC HOISTS AND CRANES.

General Electric Co.....Schenectady, N. Y.
Lidgerwood Mfg. Co.....New York.
Pawling & Harnischfeger.....Milwaukee.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

### ELECTRIC LIGHT AND POWER PLANTS.

General Electric Co.....Schenectady, N. Y.
Sturtevant, B. F. Co.....Boston.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

### EMERGENCY BOILER TUBE REPAIR STOPPERS.

Mason, H. T..... South Chi .

### ENGINE BUILDERS, MARINE.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Chicago Ship Building Co.....Chicago.
Chase Machine Co. .....Cleveland.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Dake Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co.....Detroit.
Fletcher, W. & A. Co.....Hoboken, N. J.
Fore River Ship & Engine Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit, Mich.
Hall Bros .....Philadelphia.
Jenks Ship Building Co.....Port Huron, Mich.
Lockwood Mfg. Co..... .....East Boston, Mass
Macbeth Iron Co.....Cleveland.
Milwaukee Dry Dock Co.....Milwaukee.
Mosher, Chas. D.....New York.
Moulton Steering Engine Co.....New York.
Newport News Ship Building Co.Newport News, Va.
Northwestern Steam Boiler & Mfg. Co.Duluth, Minn.
Risdon Iron Works.....San Francisco.
Roach's Ship Yard.....Chester, Pa.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co.....Superior, Wis.
Thropp, J. E. & Sons Co.....Trenton, N. J.
Trout, H. G.....Buffalo.
United States Ship Building Co.....New York.
Willard, Chas. P. & Co.....Chicago.

### ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.

Cory, Chas. & Son.....New York.

### ENGINEERING SPECIALTIES AND SUPPLIES.

Crane Co..... Chicago.
Kieley & Mueller .....New York.
Lunkenheimer Co. .....Cincinnati.
Mooers & Co., H.....Milwaukee
New York Belting & Packing Co.....New York.
Northwestern Steam Boiler & Mfg. Co.Duluth, Minn.

### ENGINEERS, MARINE, MECHANICAL, CONSULTING.

Hynd, Alexander .....Cleveland.
Hunt, Robt. W. & Co.....Chicago.
Kidd, Joseph .....Duluth, Minn.
Lovejoy, H. O. .....Buffalo.
Matteson & Drake .. .....Philadelphia.
Mosher, Chas. D.....New York.
Nacey, James .....Cleveland.
Newman & Merryweather .....New York.
Pittsburg Testing Laboratory, Ltd.....Pittsburg.
Powell. Ambrose V.....Chicago.
Rice, Henry .....Buffalo.
Roelker, H. B.....New York.
Sadler, Perkins & Field .....New York.
Steel, Adam .....Cleveland.
Wood, W. J. .....Chicago.

### FANS FOR VENTILATION, EXHAUST, ETC.

Sturtevant, B. F. Co.....Boston.

### FEED WATER PURIFIERS AND HEATERS.

Learmonth, Robert .....Buffalo.
Ross Valve Co.....Troy, N. Y.

### FIXTURES FOR LAMPS, OIL OR ELECTRIC.

General Electric Co.....Schenectady, N. Y
Westinghouse Electric & Mfg. Co....Pittsburg, Pa

### FORGES.

Sturtevant, B. F. Co.....Boston.

### FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co.....Cleveland
Fore River Ship & Engine Co.....Quincy, Mass.
Macbeth Iron Co.....Cleveland

### FLUE WELDING.

Fix's, S. Sons .....Cleveland.

### FURNACES FOR BOILERS.

Continental Iron Works .....New York.

### FUELING COMPANIES AND COAL DEALERS.

Hanna, M. A. & Co.....Cleveland.
Ironville Dock & Coal Co.....Toledo, O.
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Rochester & Pittsburg Coal & Iron Co.....Buffalo.
Smith, Stanley B., & Co.....Detroit.
Smith Coal & Dock Co., Stanley B.....Toledo, O.
Youghiogheny & Lehigh Valley Coal Co....Chicago.

### GALLEY UTENSILS.

Meckes, John ..... ..... Cleveland
Siegel Cooper Co.....New York.

### GASKETS, RUBBER.

New York Belting & Packing Co.....New York.

### GAS BUOYS.

Safety Car Heating & Lighting Co.....New York.

### GAS AND GASOLINE ENGINES.

Chase Machine Co.....Cleveland.

### GAUGES, STEAM AND VACUUM.

American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.
Lunkenheimer Co. .....Cincinnati.

### GAUGES, WATER.

Bonner & Co., Wm. T..... ..... Boston
Lunkenheimer Co..... ..... Cincinnati.

### GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

### GROCERIES AND SUPPLIES.

Siegel Cooper Co.....New York.

### HAMMERS, STEAM.

Chase Machine Co.....Cleveland.

### HEATING APPARATUS.

Sturtevant, B. F. Co.....Boston.

### HOISTS FOR CARGO, ETC.

American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co. (Inc.)....Cleveland.
Chase Machine Co.....Cleveland.
Elwell-Parker Electric Co.....Cleveland.
General Electric Co.....New York.
Hyde Windlass Co.....Bath, Me.
Lidgerwood Mfg. Co.....New York.
Marine Iron Co .....Bay City.
Pawling & Harnischfeger.....Milwaukee.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

### HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

### HOSE, RUBBER.

New York Belting & Packing Co.....New York.

### HYDRAULIC DREDGES.

Great Lakes Engineering Works.....Detroit.

### HYDRAULIC TOOLS.

Watson-Stillman Co., The.....New York.

### ICE MACHINERY.

Roelker, H. B.....New York.

### INDICATORS FOR STEAM ENGINES.

American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.

### INJECTORS.

American Injector Co.....Detroit.
Crane Co.....Chicago.
Jenkins Bros. .....New York.
Lunkenheimer Co.....Cincinnati.
Penberthy Injector Co.....Detroit, Mich.

### INSURANCE, MARINE.

Brown & Co.....Buffalo.
Elphicke, C. W. & Co.....Chicago.
Fleming & Co., P. H.....Chicago.
Frankfort Marine, A. & P. G. Ins. Co....New York.
Gilchrist & Co., C. P.....Cleveland.
Hawgood & Co., W. A.....Cleveland.
Helm & Co., D. T.....Duluth
Hutchinson & Co.....Cleveland.
McCarthy, T. R.....Montreal.
McCurdy, Geo. L.....Chicago.
Mitchell & Co.....Cleveland.
Moffat & Son.....San Francisco.
Peck, Chas. E. & W. F.....New York and Chicago.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.
Voss, F. D.....New York.
Weeks, F. H.....New York.

### IRON ORE AND PIG IRON.

Bourne-Fuller Co.....Cleveland.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland

### LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Marine Construction & D. D. Co.....
.....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P.....Chicago.

### LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong Cork Co. .....Pittsburg.
Carley Life Float Co.....New York.
Drein, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, D.....New York.
Lane & DeGroot.....Long Island City, N. Y.
Marine Construction & Dry Dock Co.....
.....Mariner's Harbor, S. I., N. Y.

### LIGHTS, SIDE AND SIGNAL.

Russell & Watson .....Buffalo.

### LOGS.

Bliss, John & Co.....New York.
Nicholson Ship Log Co.....Cleveland.
Walker & Sons, Thomas.....Birmingham, Eng.
Also Ship Chandlers.

### LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

### LUBRICATORS.

Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

### LUMBER.

Martin-Barriss Co .....Cleveland.
Shurick, F. S. .....New York.

### MACHINISTS.

Chase Machine Co.....Cleveland.
Lockwood Mfg. Co.....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
Mooers & Co., H.....Milwaukee.
Union Machine & Boiler Co.....Cleveland.

### MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc.....Philadelphia.

### MARINE RAILWAYS, BUILDERS OF.

Crandall & Son, H. I.....East Boston, Mass

### MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.....New York.
Meckes John..... ..... Cleveland
Siegel Cooper Co.....New York.
Williams & Rodgers Co., ..... Cleveland.

### MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland
Detroit Ship Building Co.....Detroit
Sturtevant, B. F. Co.....Boston

### METALLIC PACKING.

Katzenstein, L. & Co.....New York
U. S. Metallic Packing Co.....Philadelphia

### METAL POLISH.

Bertram's Oil Polish Co.....Boston

### MOTORS, GENERATORS—ELECTRIC.

General Electric Co.....Schenectady, N. Y
Sturtevant, B. F. Co.....Boston
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

### NAUTICAL INSTRUMENTS.

Bliss, John & Co.....New York
Ritchie, E. S. & Sons.....Brookline, Mass

### NAUTICAL SCHOOLS.

Seattle Nautical School .....Seattle, Wash

# BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

### NAVAL ARCHITECTS.

Hynd, Alexander .....Cleveland.
Kidd, Joseph .....Duluth, Minn.
Lovejoy, H. O. .....Buffalo.
Matteson & Drake .....Philadelphia.
Mosher, Chas. D.....New York.
Nacey, James .....Cleveland.
Newman & Merryweather .....New York.
Rice, Henry .....Buffalo.
Sadler, Perkins & Field.....New York.
Steel, Adam .....Cleveland.
Wood, W. J.....Chicago.

### OAKUM.

DeGrauw, Aymar & Co.....New York.
Stratford Oakum Co .....Jersey City, N. J.

### OIL FOR PAINTING.

Sipe & Co., James B.....Allegheny, Pa

### OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph.....Jersey City, N. J.
Standard Oil Co.....Cleveland

### PACKING.

American Steam Packing Co.....Boston.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Katzenstein, L. & Co.....New York.
New York Belting & Packing Co.....New York.
United States Metallic Packing Co....Philadelphia

### PAINTS.

Baker, Howard H. & Co.....Buffalo
Detroit Varnish Co.....Detroit.
Detroit White Lead Works.....Detroit.
Forest City Paint and Varnish Co .... Cleveland.
New Jersey Zinc Co.....New York.
Sipe & Co., James B.....Allegheny, Pa.
Upson-Walton Co. .....Cleveland

### PATENT ATTORNEYS.

Thurston & Bates .....Cleveland

### PATTERN SHOP MACHINERY.

Atlantic Works, Inc.....Philadelphia

### PILE DRIVING AND SUBMARINE WORK.

Buffalo Dredging Co .....Buffalo
Chicago & Gt. Lakes Dredge & Dock Co...Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simon & Connell Co.....Chicago.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H.....Milwaukee.

### PIPE, WROUGHT IRON.

Bourne-Fuller Co.....Cleveland.
Crane Co. .....Chicago.
Macbeth Iron Co. .....Cleveland

### PLANING MILL MACHINERY.

Atlantic Works, Inc.....Philadelphia.

### PLATES—SHIP, STRUCTURAL, ETC.

Bourne-Fuller Co. .....Cleveland

### PLUMBING, MARINE.

Sands, Alfred B. & Son.....New York

### PNEUMATIC TOOLS.

Allen, John F.....New York.

### POLISH FOR METALS.

Bertram's Oil Polish Co.....Boston.

### PRESSURE REGULATORS.

Kieley & Mueller .....New York.
Ross Valve Co.....Troy, N. Y.

### PROPELLER WHEELS.

American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Fore River Ship & Engine Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.Newport News, Va.
Phosphor Bronze Smelting Co., Ltd.....Philadelphia.
Risdon Iron Works .....San Francisco.
Roelker, H. B.....New York.
Sheriffs Mfg. Co.....Milwaukee.
Superior Shipbuilding Co.....Superior, Wis.
Thropp & Sons Co., J. E.....Trenton, N. J.
Trout, H. G.....Buffalo.
United States Ship Building Co.....New York.

### PROJECTORS, ELECTRIC.

Bogue, Chas. J. ..... New York.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

### PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F., Mfg. Co.....New York.
Great Lakes Engineering Works.....Detroit.
Kingsford Foundry & Machine Wks..Oswego, N. Y.

### PUNCHES, RIVETERS, SHEARS.

Allen, John F.....New York.

### RANGES.

Russell & Watson .....Buffalo.
Siegel Cooper Co.....New York.

### REFRIGERATING APPARATUS.

Roelker, H. B.....New York.

### REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register .....Cleveland.
Record of American & Foreign Shipping..New York.

### RIVETING MACHINES.

Allen, John F.....New York.

### RIVETS, STEEL, FOR SHIPS AND BOILERS.

Bourne-Fuller Co.....Cleveland.

### SAFETY VALVES.

American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.
Crane Co. .....Chicago.
Hayden Mfg. Co., N. L.....Columbus, O.
Lunkenheimer Co. .....Cincinnati.

### SAIL MAKERS.

Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland.
Wilson & Silsby .....Boston.

### SALVAGE COMPANIES.

See Wrecking Companies.

### SCHOOLS, NAUTICAL.

Seattle Nautical School .....Seattle, Wash.

### SEARCH LIGHTS.

Bogue, Chas. J. ..... New York.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

### SHEARS.

See Punches, Rivets, and Shears.

### SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co.....Cleveland.

### SHIP BUILDERS.

American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Buffalo Dry Dock Co.....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co.....Detroit.
Fore River Ship & Engine Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Jenks Ship Building Co.....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.Newport News, Va.
Risdon Iron Works .....San Francisco.
Roach's Ship Yard.....Chester, Pa.
Shipowner's Dry Dock Co.....Chicago.
Smith & Son, Abram .....Algonac, Mich.
United States Ship Building Co.....New York.
Willard, Chas. P. & Co.....Chicago.

### SHIP CHANDLERS.

Baker, Howard H. & Co.....Buffalo.
Reilly Repair & Supply Co., James.....New York.
Upson-Walton Co.....Cleveland.

### SHIP LANTERNS AND LAMPS.

Russell & Watson .....Buffalo.

### SHIP TIMBER.

Martin-Barriss Co. .....Cleveland.
Shurick, F. S.....New York.

### SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co.....Jersey City, N. J.

### STAYBOLTS, IRON OR STEEL, HOLLOW, OR, SOLID.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

### STEAM VESSELS FOR SALE.

Elwell, Jas. W. & Co.....New York.
Gilchrist & Co., C. P.....Cleveland.
Holmes, Samuel .....New York.
McCarthy, T. R.....Montreal, Can.
Newman & Merryweather .....New York.
Weeks, F. H.....New York.

### STEAMSHIP LINES, PASS. AND FREIGHT.

American Line.....New York.
International Mercantile Marine Co....Philadelphia.
Pere Marquette R. R. & S. S. Line.....Milwaukee.
Red Star Line .....New York.

### STEEL CASTINGS.

Seaboard Steel Casting Co.....Chester, Pa.
Macbeth Iron Co.....Cleveland.

### STEERING APPARATUS.

American Ship Building Co.....Cleveland.
Chase Machine Co.....Cleveland.
Dake Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co.....Detroit.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.
Moulton Steering Engine Co.....New York.
Pawling & Harnischfeger .....Milwaukee.
Sheriffs Mfg. Co. .....Milwaukee.

### STOCKS, BONDS, SECURITIES.

Fahey & Co.....Cleveland.

### SUBMARINE DIVING APPARATUS.

Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

### SURVEYORS, MARINE.

Gaskin, Edward .....Buffalo.
Hynd, Alexander .....Cleveland.
Lovejoy, H. O. .....Buffalo.
Matteson & Drake .....Philadelphia.
Nacey, James .....Cleveland.
Newman & Merryweather .....New York.
Rice, Henry .....Buffalo.
Steel, Adam .....Cleveland.
Wood, W. J.....Chicago.

### TESTS OF MATERIALS.

Hunt, Robert W. & Co.....Chicago.
Pittsburg Testing Laboratory Ltd.....Pittsburg.

### TILING, INTERLOCKING RUBBER.

New York Belting & Packing Co.....New York.

### TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Allen, John F. .....New York.
Watson-Stillman Co. .....New York.

### TOOLS, WOOD WORKING.

Atlantic Works, Inc.....Philadelphia.

### TOWING MACHINES.

American Ship Windlass Co.....Providence, R. I.
Chase Machine Co.....Cleveland.

### TOWING COMPANIES.

Donnelly Salvage & Wrecking Co....Kingston, Ont.
Midland Towing & Wrecking Co., Ltd.Midland, Ont.

### TRAPS, STEAM.

Kieley & Mueller .....New York.
Lunkenheimer Co. .....Cincinnati.
Sturtevant Co., B. F., Jamaica Plain.....Boston.

## BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

**TRUCKS.**

Boston & Lockport Block Co.....Boston.

**TUBING, SEAMLESS.**

Shelby Steel Tube Co.....Pittsburg, Pa.

**VALVES, STEAM SPECIALTIES, ETC.**

American Steam Gauge Co.....Boston.
Ashton Valve Co .....Boston.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Kieley & Mueller .....New York.
Lunkenheimer Co. .....Cincinnati.
Mooers & Co., H.....Milwaukee.
Ross Valve Co. .....Troy, N. Y.

**VALVES FOR WATER AND GAS.**

Ross Valve Co.....Troy, N. Y.

**VARNISHES.**

Detroit Varnish Co .....Detroit.
Detroit White Lead Works.....Detroit.
Forest City Paint & Varnish Co., .....Cleveland
New Jersey Zinc Co.....New York.
Also Ship Chandlers.

**VENTILATING APPARATUS FOR SHIPS.**

Sturtevant, B. F. Co.....Boston.

**VESSEL AND FREIGHT AGENTS.**

Boland, John J.....Buffalo.
Brown & Co. .....Buffalo.
Elwell, Jas. W. & Co.....New York.
Elphicke, C. W. & Co.....Chicago.
Fleming & Co., P. H.....Chicago.
Gilchrist & Co., C. P.....Cleveland.
Hall & Root .....Buffalo.
Helm & Co., D. T.....Duluth.
Hawgood & Co., W. A.....Cleveland.
Holmes, Samuel .....New York.
Hutchinson & Co. .....Cleveland.
McCarthy, T. R.....Montreal.
Newman & Merryweather .....New York.
Mitchell & Co. .....Cleveland.
Prindiville & Co. .....Chicago.
Richardson, W. C. .....Cleveland.
Sullivan, D. & Co.....Chicago.
Weeks. F. H.....New York.

**WATER GAUGES.**

Bonner & Co., Wm. T.....Boston
Lunkenheimer Co.....Cincinnati, O.

**VESSEL FURNISHINGS.**

Meckes, John .....Cleveland
Siegel Cooper Co.....New York.
Williams & Rodgers Co, .....Cleveland.

**WIRE ROPE AND WIRE ROPE FITTINGS.**

Baker, H. H. & Co.....Buffalo.
DeGrauw, Aymar & Co.....New York.
Upson-Walton Co. .....Cleveland.

**WHISTLES, STEAM.**

American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.
Lunkenheimer Co. .....Cincinnati.

**WINDLASSES.**

American Ship Windlass Co.....Providence, R. I.
American Ship Building Co.....Cleveland.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.

**WINCHES.**

American Ship Windlass Co.....Providence, R. I.
Hyde Windlass Co.....Bath, Me.

**WOOD WORKING MACHINERY.**

Atlantic Works, Inc.....Philadelphia.

**WRECKING AND SALVAGE COMPANIES.**

Donnelly Salvage & Wrecking Co..Kingston, Ont.
Midland Towing & Wrecking Co., Ltd.Midland, Ont.

**YACHT AND BOAT BUILDERS.**

Drein, Thos. & Son.....Wilmington, Del.
Lane & DeGroot.....Long Island City, N. Y.
Marine Construction & Dry Dock Co....New York.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P. & Co.....Chicago.

**YAWLS.**

Drein, Thos. & Son.....Wilmington, Del.
Lane & DeGroot.....Long Island City, N. Y.

# ALPHABETICAL INDEX OF ADVERTISERS IN THE MARINE REVIEW.

The star (*) indicates that the advertisement appears alternate weeks. For addresses see advertisements on pages noted.
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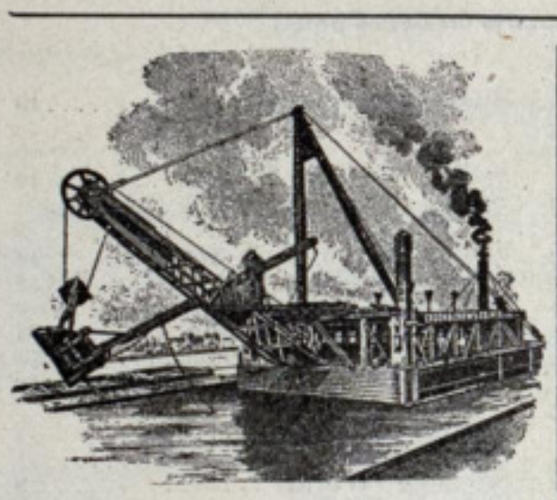

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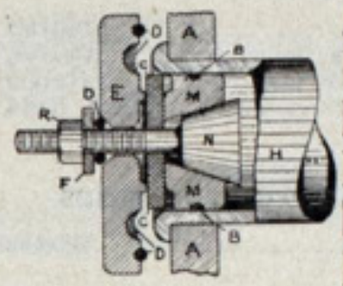

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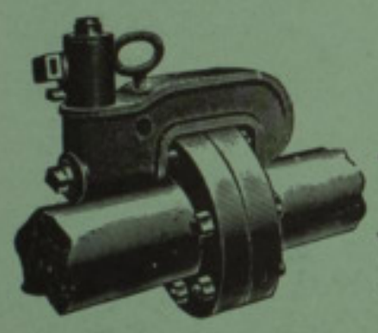

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| Eastward. | Arrive from West | Depart East. |
|---|---|---|
| No. 18, Southwestern Lim | ..... | *1:50am |
| No. 22, Lake Shore Lim... | *2:12am | *2:20am |
| No. 20, Chi & Cleve Ex.... | *7:20am | ..... |
| No. 28, N Y & Bost Ex.... | *7:40am | *8:00am |
| No. 40, Toledo & Buff Ac. | †10:00am | †10:40am |
| No. 32, Fast Mail ..... | *11:25am | *11:30am |
| No. 48, Ac via Sandusky.. | †1:40pm | .. |
| No. 44, Cleve. & N. Y Sp. | ..... | *3:00pm |
| No. 46, Southwestern Ex. | .... | *3:10pm |
| No. 116, Conneaut Accom | ..... | †4:30pm |
| No. 6, Lim Fast Mail.... | *5:40pm | *5:45pm |
| No. 26, 20th Cent Lim. .... | *7:40pm | *7:43pm |
| No. 10, C., N Y & B Sp.... | *7:30pm | *7:50pm |
| No. 16, New Eng Ex..... | *10:30pm | *10:35pm |
| No. 2, Day Express. | †9:10pm | †9.25pm |
| No. 126, Norwalk Accom. | †8:10am | ..... |

| Westward. | Arrive from East. | Depart West. |
|---|---|---|
| No. 11, Southwestern Lim | *3:25am | ..... |
| No. 7, Day Express.. .... | ..... | †6:00am |
| No. 15, Bost & Chi Sp..... | *3:05am | *3:15am |
| No. 19, Lake Shore Lim.. | *7:05am | *7:15 m |
| No. 23, Western Express. | *10:30am | *10:35am |
| No. 29, Southwestern Sp. | ‡11:10am | ..... |
| No. 33, Southwestern Ex | *12:25pm | .... |
| No. 133, Cleve & Det Ex.. | ..... | *12:45p m |
| No. 47 Accomodation..... | †11.00am | †3:00pm |
| No. 141, Sandusky Accom. | ..... | †3:10pm |
| No. 43, Fast Mail ..... | *4:35pm | *4:40pm |
| No. 127, Norwalk Accom.. | ..... | †5:10pm |
| No. 37, Pacific Express... | *6:50pm | *7:20pm |
| No. 3, Fast Mail Lim..... | *10:50pm | *10:55pm |
| No. 115, Conneaut Accom. | *8:30am | ..... |

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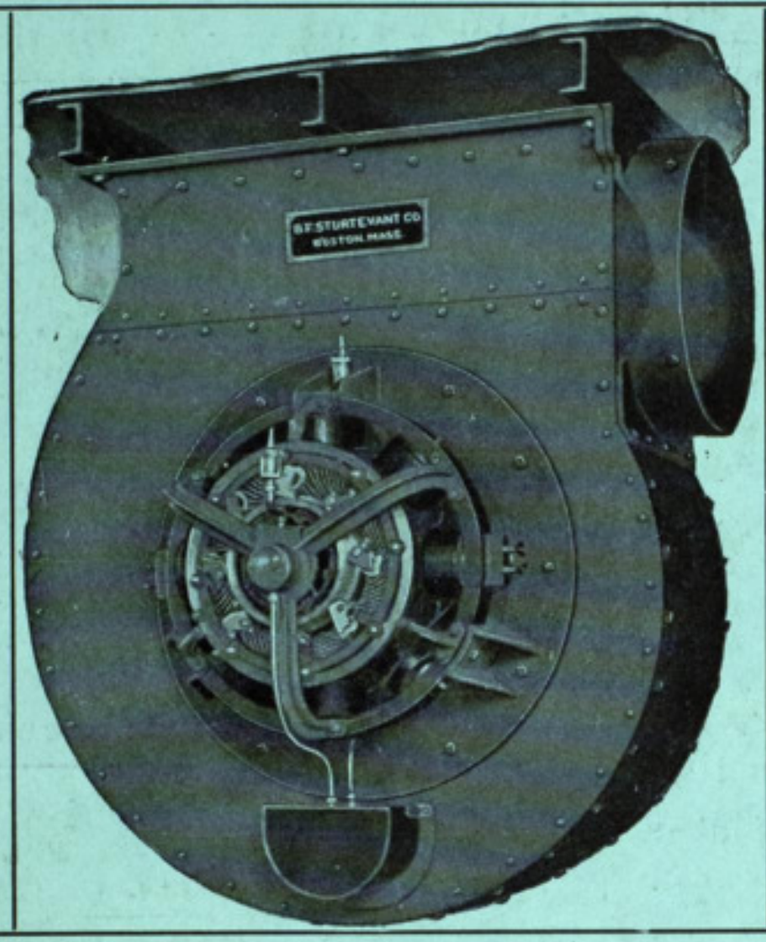


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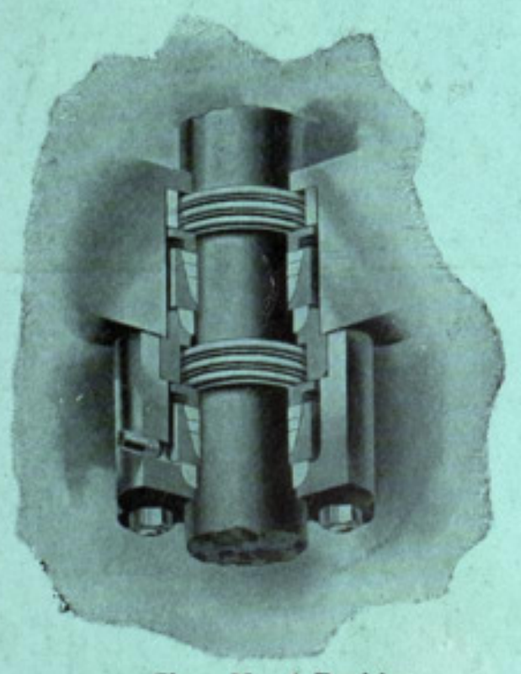

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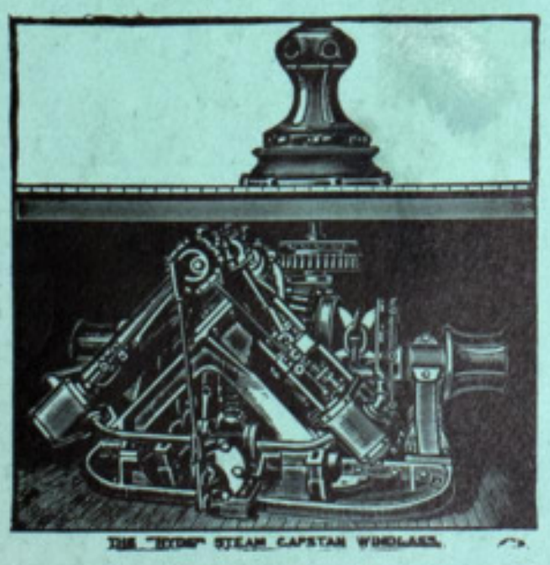


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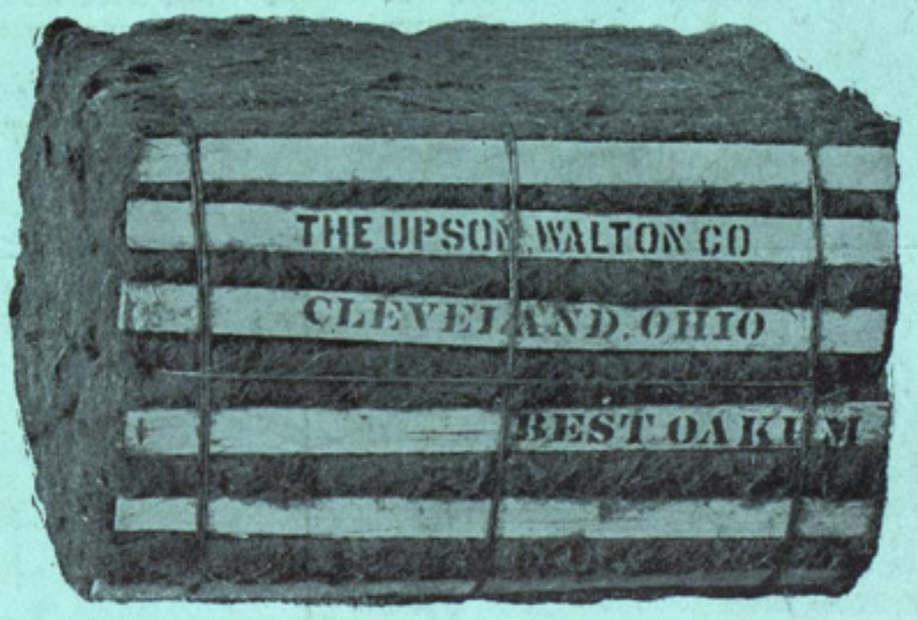


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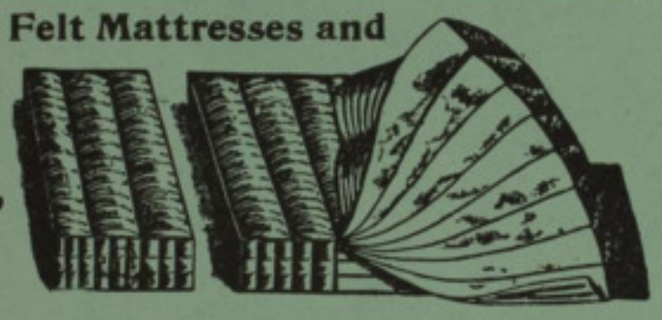

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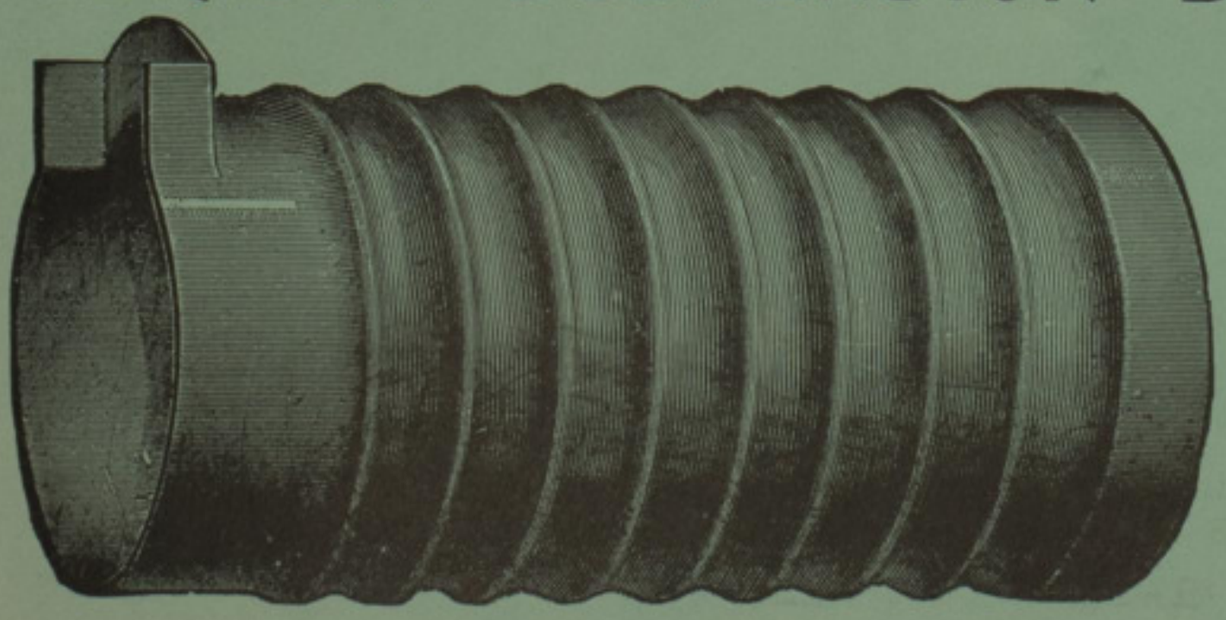

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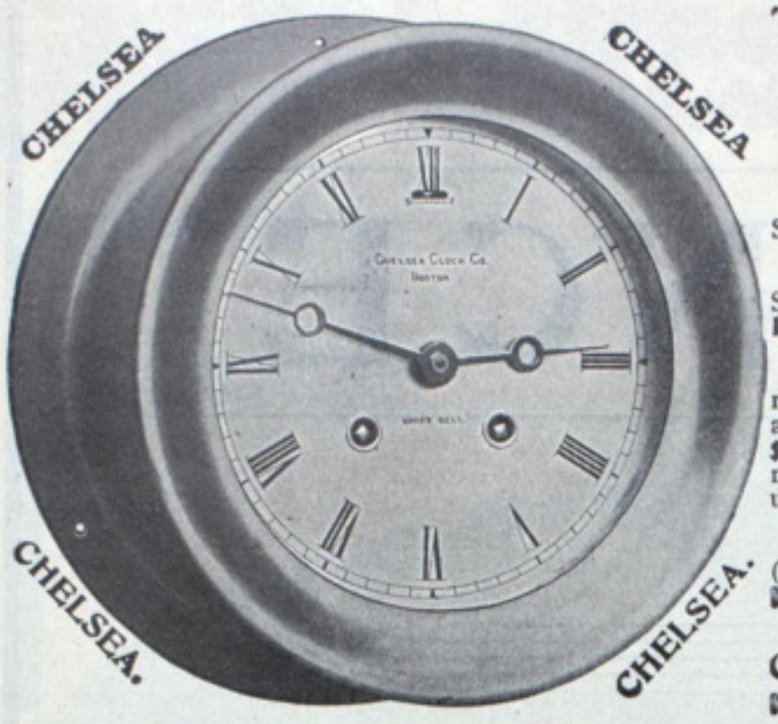


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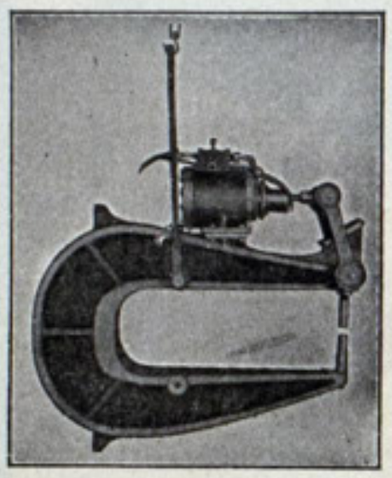

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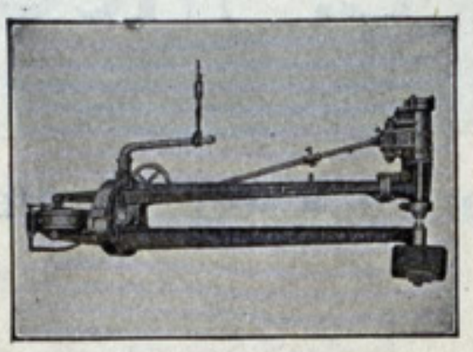

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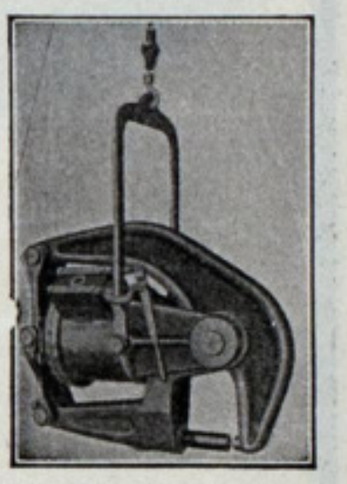

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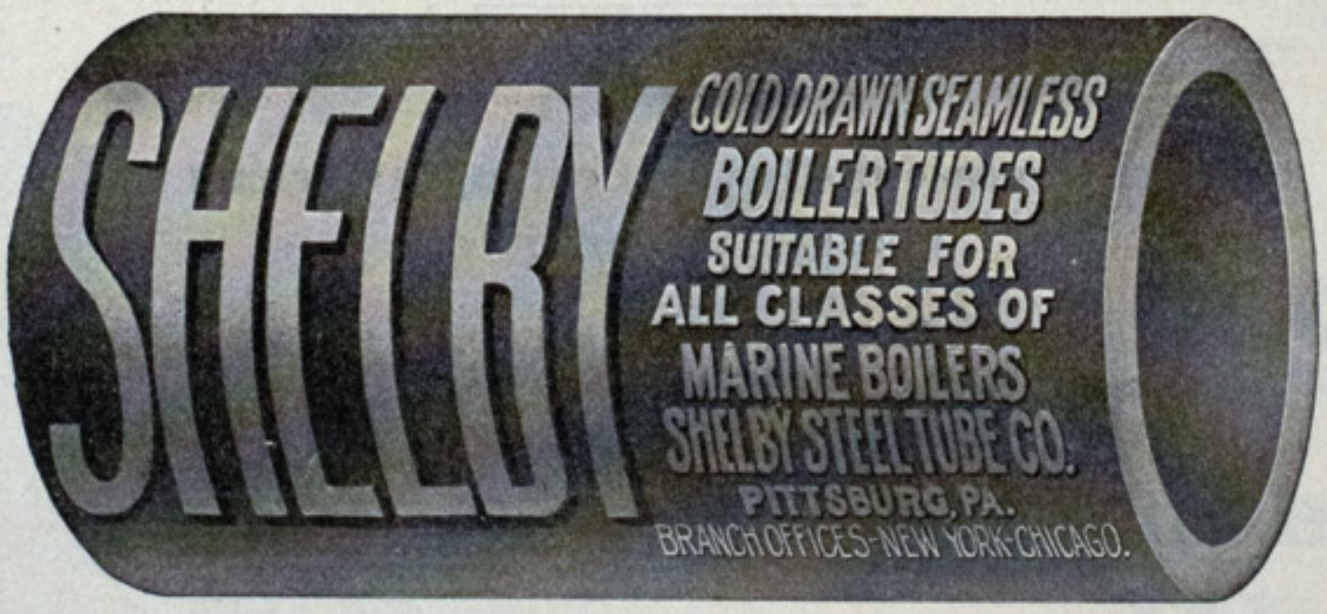


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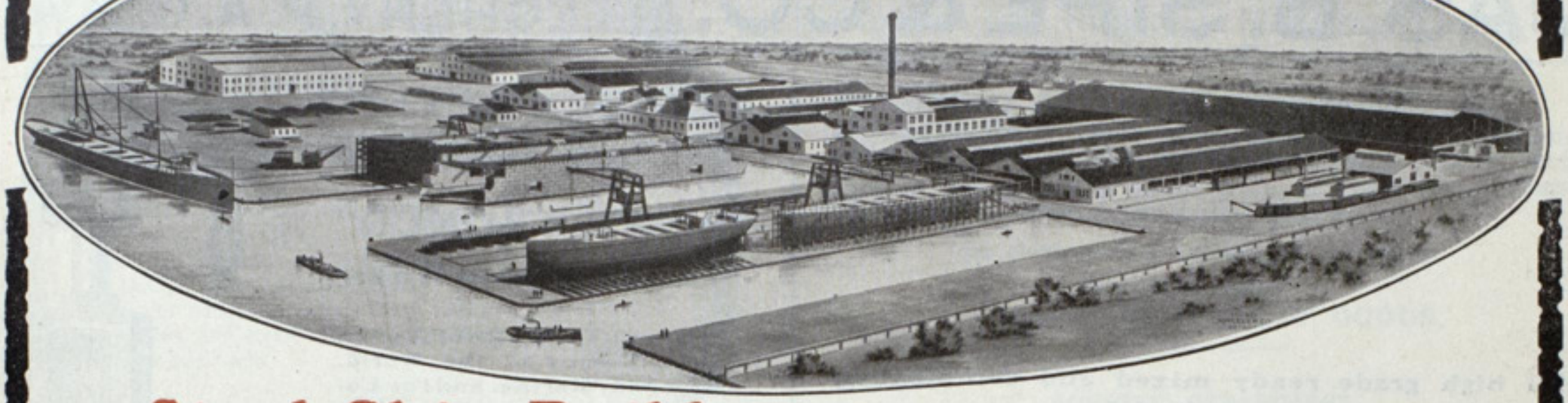

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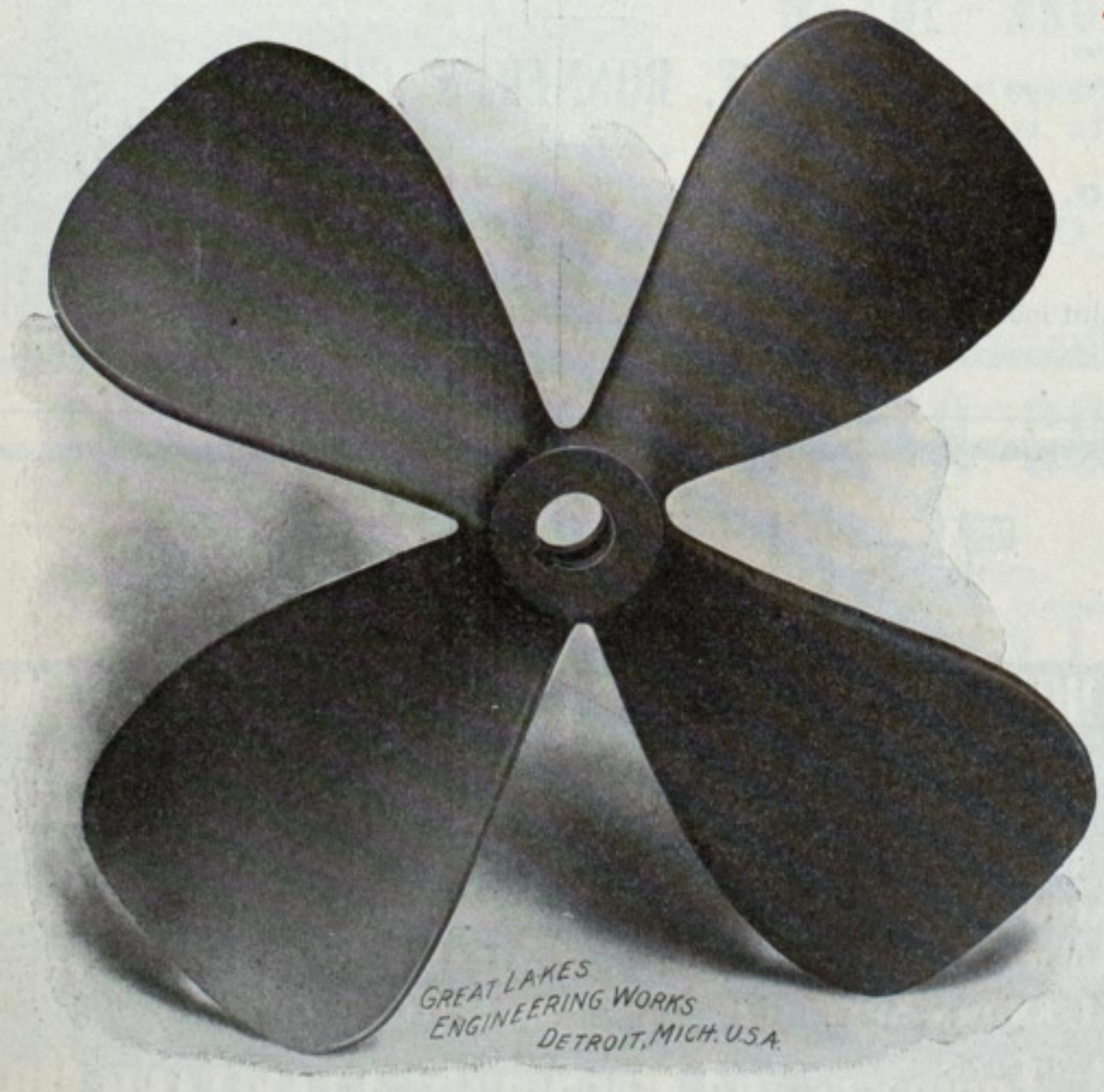


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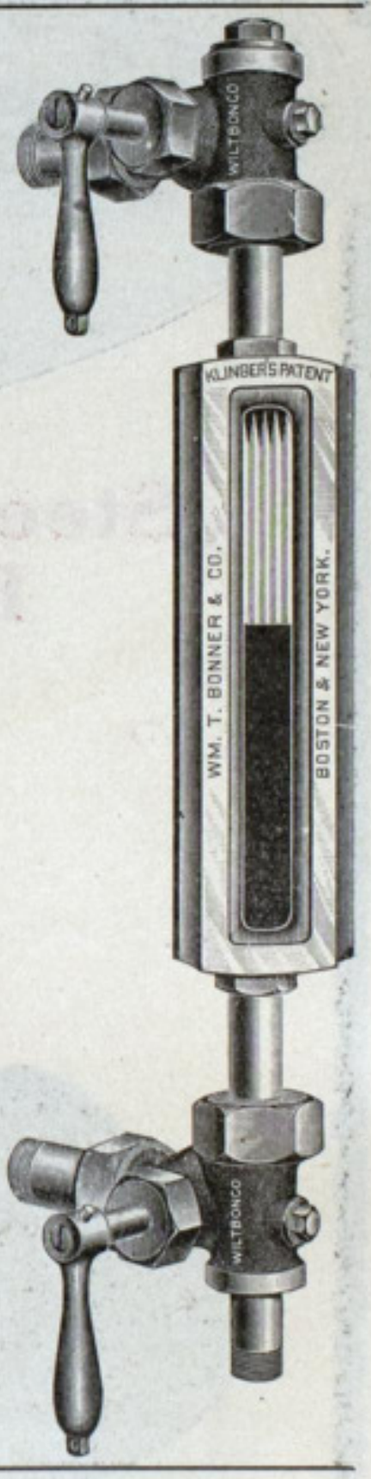


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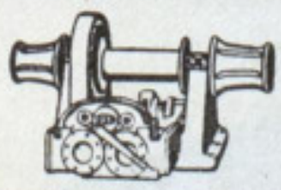

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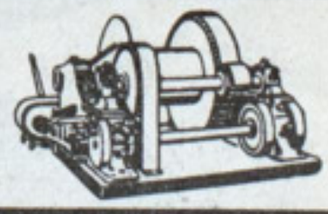

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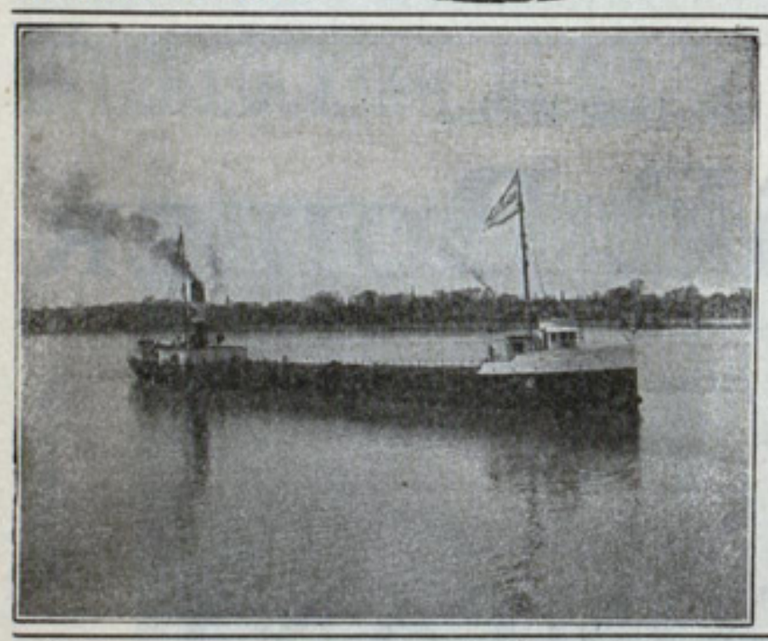

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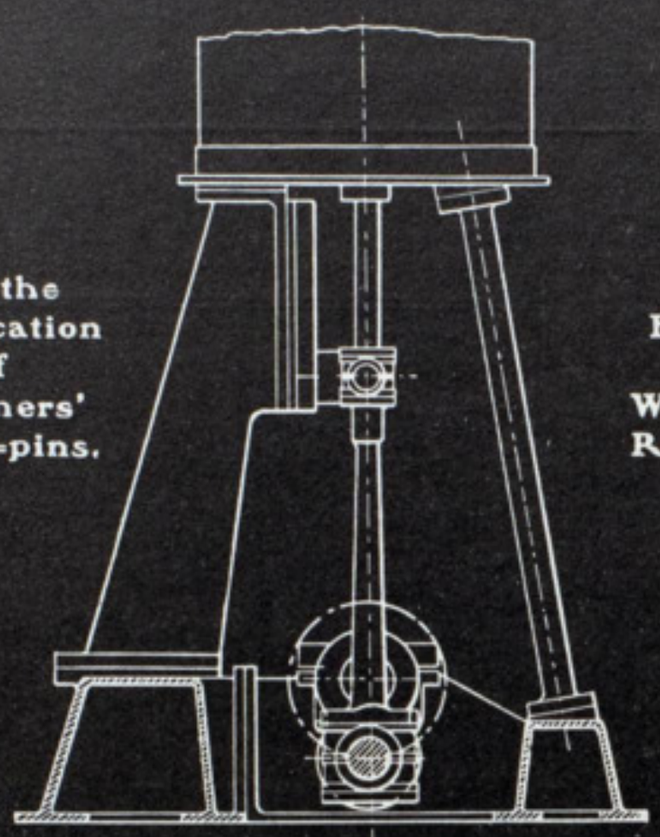

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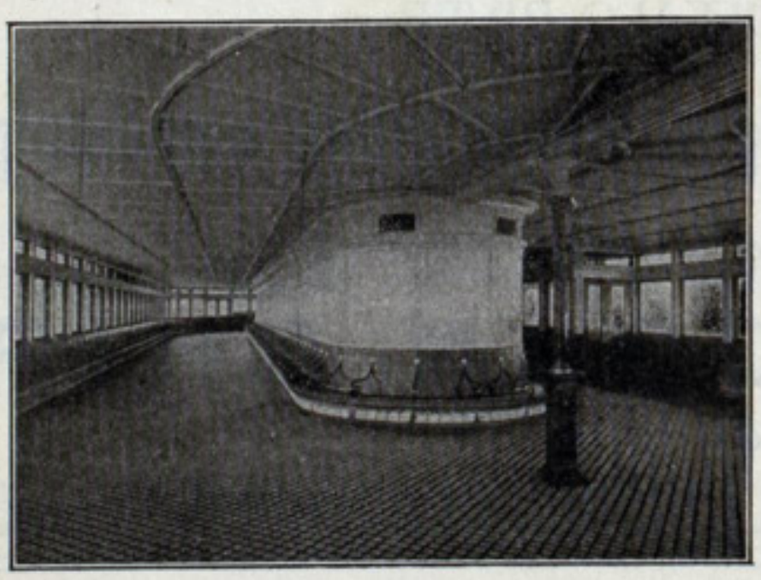

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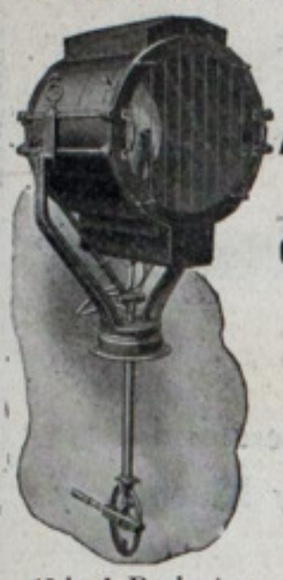

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